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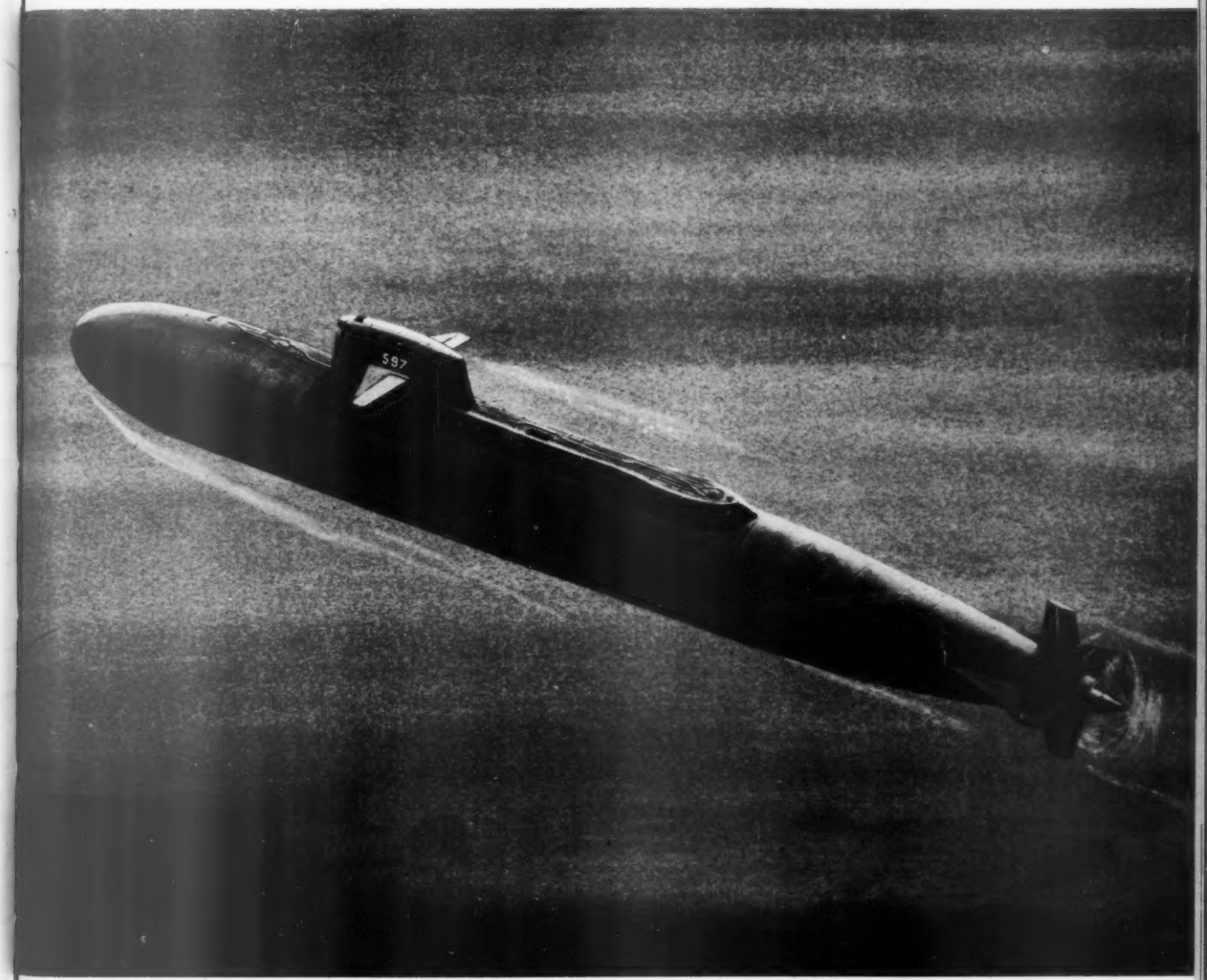
ARMED FORCES management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS



What Industry Thinks of the ASW Problem ..... p. 14

Are You a Space Age Executive? ..... p. 17

complete contents ... p. 3

We have often observed that people who have not had close contact with Western Gear Corporation are misled by the corporation name into the assumption that we are limited to gears and gear-operated products.

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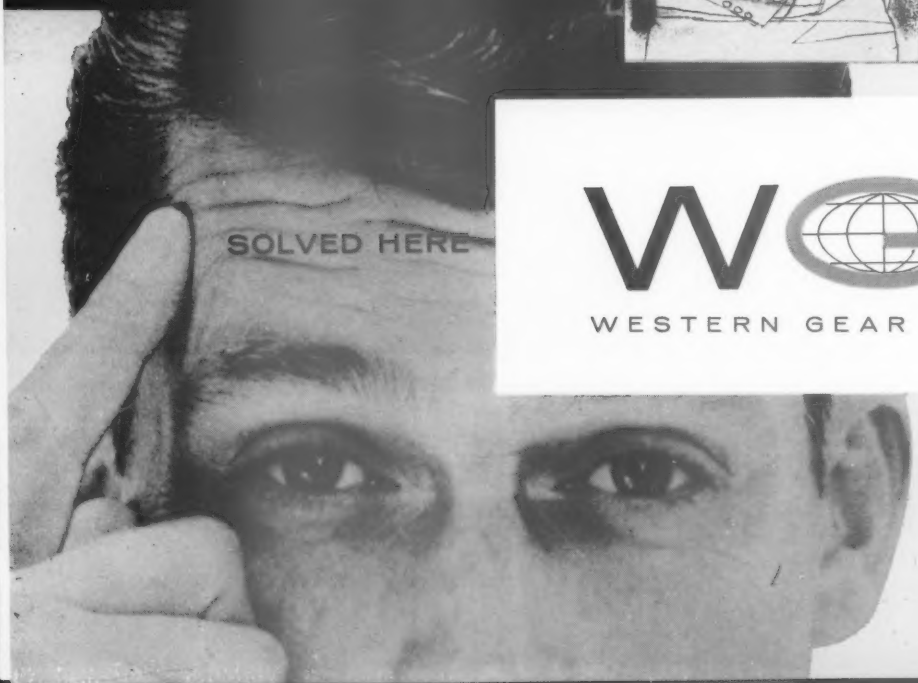

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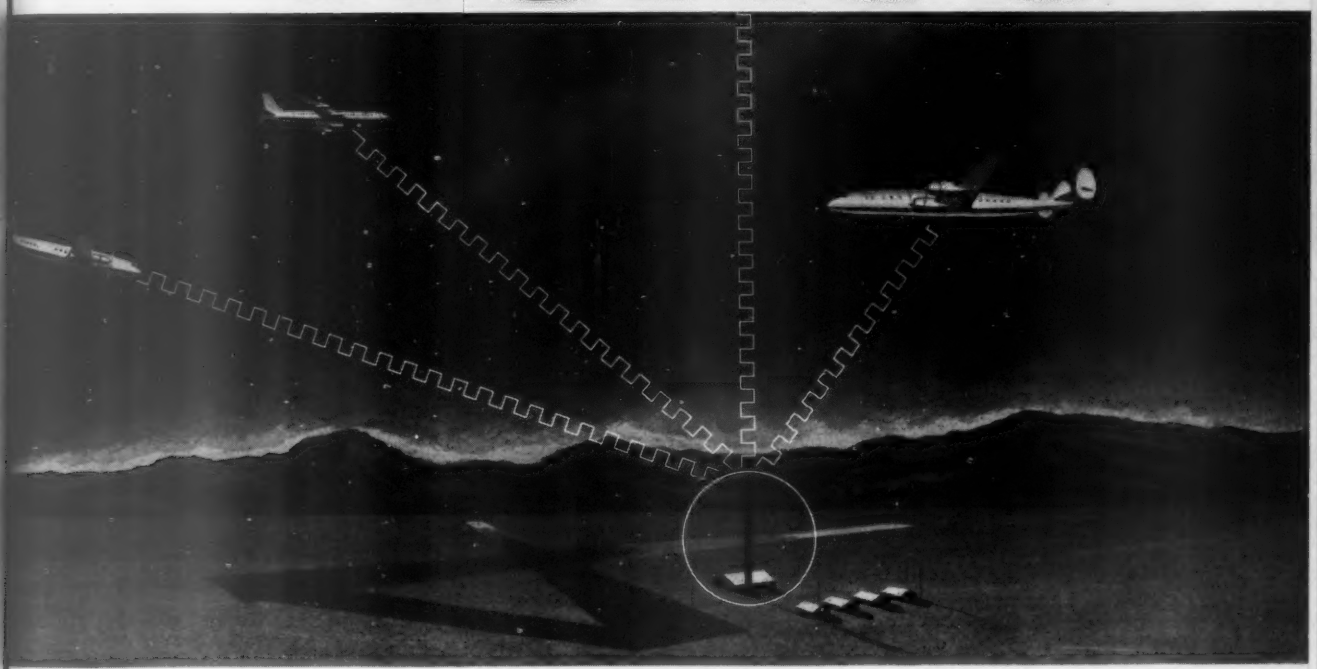
5923

new wings for words

AGACS

pronounced "AJAX"



AGACS, Experimental Automatic Ground/Air/Ground Communication System is a new concept in Air Traffic Control Communications to meet the accelerated pace of increased air traffic. Primary objectives are efficient usage of frequency spectrum, added safety through increased reliability and reduced burden to pilot and controller, and adaptability to all classes of aircraft. AGACS provides compatibility with existing ground and airborne communication equipment, selective addressing of information, and a minimum number of frequency changes during flight. The system utilizes two-way time division data transfer over existing ground and air communication links to provide an automatic, mutual exchange of information. The airborne facilities display to the pilot the last significant Air/Ground and Ground/Air message quantities, while the controller may recall from central memory-storage equipment the last Air/Ground and Ground/Air message quantities for display. The AGACS program is still in the developmental stage. In August, 1959, RCA provided initial models of both airborne and ground equipments for the Bureau of Research and Development of the Federal Aviation Agency for extensive experimentation and flight tests.

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ARMED FORCES management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS

SEPTEMBER, 1959

Volume 5—No. 12

FEATURES

What Industry Thinks About the ASW Problem 14

Industry is taking an active part in solving one of the most vexing problems that faces defense planners today. This survey article gives a cross-section of industry opinion on what is being done in this area—and, more important, what should be done.

Can You Become a Space Age Executive? 17

Author E. D. Dwyer maintains that too many people pay lip service to reporting by exception, increasing the boss's workload and distorting the information he has to work with. Also presented are the criteria by which reporting by exception should be judged.

Proficiency Testing: A Tool for Management 19

It still takes a man to fire the missile—and this is how the Army is making sure they have the right man to do the job.

Most Important Tool: Management Analysis 24

Part II of Black Saturday at BMD. The key to a successful operation of BMD's scope is giving the manager the right information—and all of the information he needs.

Making the Industrial Team Work 34

It is no easy job to make several different companies work as an integrated team for Defense development. These are the check-points used by one of the most experienced team leaders.

The Easy Way to ER Administration 37

Author Maj. Jay H. Williams suggests a proven method for cutting the administrative burden on Effectiveness Reports.

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FEATURED NEXT MONTH

How Army's Arsenal System Works . . . BuAer Puts Value Analysis to Work . . . What Fragmenting Authority Has Done to Military Buying.

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CAPABILITIES FOR DEFENSE

FROM THE SEA COMES A MAJOR THREAT...

The environment of the sea favors the submarine. This makes antisubmarine warfare—from detection to kill—one of the most formidable tasks faced by the U. S. Navy. Missile-firing nuclear subs further complicate this acute defense problem. ASW calls for all the imagination, skill and resourcefulness that industry, in its assisting role, can bring to bear.

Westinghouse is engaged in a program to help our forces deal with this increasingly urgent challenge. The corporation's facilities—from research laboratories to manufacturing divisions—are working to help solve this threat.

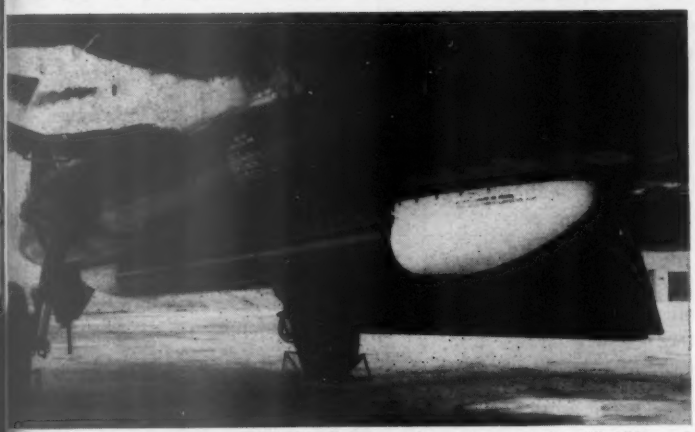
A BROAD WESTINGHOUSE ASW P

IMAGINATION: Westinghouse developments in scanning systems, cells and special circuitry make possible detection of submarines in a tactical environment.

Developments in computer techniques and components provide the means for fully integrated ASW weapon systems, assuring early detection and sure kill. Typical is this new digital computer from the Westinghouse AIR ARM DIVISION.

SKILL: New ra
ELECTRONICS
effectiveness to
never before a
The precision-
effectively atta
the Navy by t

ASW PROGRAM IS HELPING TO MEET THIS MENACE



SKILL: New radar equipment is in the design and test stage at the AIR ARM and ELECTRONICS DIVISIONS. These Westinghouse radar developments will add effectiveness to ASW search and detection operations in a manner and to a degree never before achieved.

The precision-guided ASTOR torpedo system, provides a powerful weapon in effectively attacking enemy submarines. The ASTOR was designed and built for the Navy by the Westinghouse ORDNANCE DEPARTMENT.

RESOURCEFULNESS: From Westinghouse RESEARCH LABORATORIES comes special knowledge needed for the ASW program. An example is fundamental work aimed at understanding underwater sound "scatterers."

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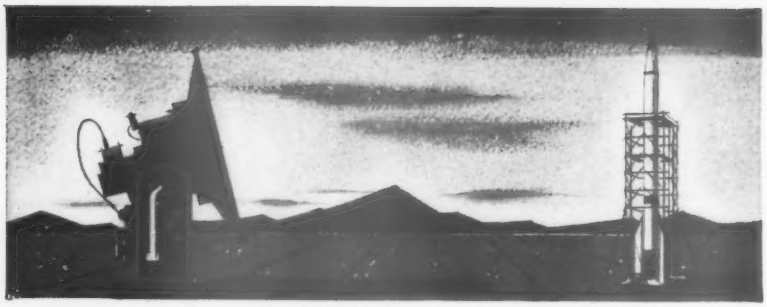

Reliability is Everybody's Business

About a hundred years ago Charles Babbage drew up a workable design for a computer which employed the principles on which all modern electronic computers are based. He spent his own substantial fortune attempting to build it. A little inaccuracy in machine tolerances prevented its completion. He died an embittered old man.

The tragedy of Babbage's life was that machine tool design was not far enough advanced to produce parts with the accuracy his design required. How often is a similar tragedy enacted today? Feasible systems are unworkable when components of the required standards are not available. But a greater tragedy lies not so often in the state of the art of components fabrication, as in failure to produce the components which the art permits.

We must all share responsibility when a weapons system fails. Reliability should be a prime concern of management in establishing its policies, of engineers in creating their design, of the manufacturer in producing, of quality control in verifying production in accordance with design and of the purchasing department in procurement.

Let's redefine reliability and make it our job.

George J. Pandapas
President

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For more facts request No. 1 on reply card.

In My Opinion

Congressional Kickback

In your Washington Background column in the August issue, you dismiss the investigation now in progress by the Manpower Utilization Subcommittee as "peanuts." You indicate that only servant-type assignments are involved and that the total number of men is only 2400.

I am afraid it is a case of your setting up your own target, then knocking it down.

Misuse of personnel by placing them in servant-type duties is only one facet of the broad manpower problem being investigated by our subcommittee, under the chairmanship of Congressman Melvin Price of Illinois.

We have also been studying use of enlisted men in officers' clubs and other non-appropriated fund activities, in commissaries, and in various other assignments where the contribution to the military effort is questionable.

We are also exploring the use of combat-trained men in jobs which could be performed by civilians without lowering our military readiness and thereby free many men for strictly military assignments.

The number of men involved is far more than 2400. One high-ranking officer has told me that three divisions could be added to the Army alone if better manpower practices were followed.

I am hopeful that our Subcommittee's efforts can help bring about a significant increase in the ratio of combat assignments to total strength in all services. And this, I submit, is not "peanuts."

Hon. Frank Kowalski

Member of Congress

We naively assume that the purpose of legislative investigation is to pave the way for Congressional passage of law . . . we would ask again—as we did in the original news item—"How do you legislate what tasks military personnel can perform and which ones they cannot?"—Ed.

Omission

I have read with interest your July issue and particularly "The Impending EDP Personnel Crisis" by Harry H. Fite and "So You Think You Want a Computer" by Cmdr. M. Vance Fowler. The articles were both timely and accurate.

In reviewing the "Comparison of Major Computer Systems" on pages 24-25, I found no mention of the RCA

(*Continued on page 51*)

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Splinter Promoters

WITH a nod toward the value of esprit de corps, etc., Army Secretary Brucker said, one day last month, "Nevertheless, it is imperative that we bring an amalgamation of all arms, services and components into one Army (to achieve) unity of effort, purpose and identity."

Army's top executive might easily have been discussing a headache suffered by the entire Defense department in its crawling struggle down the road to unification. One reason it's a struggle: the divisive influence of an arm-long list of military associations, each trying to push its own particular service or branch namesake to stage center. "We'll worry about what we're doing after we decide who's the star."

To develop a much needed, truly unified military service is going to require a high level of statesmanship on the part of every top executive concerned with national defense. But the behavior lately of these groups, who have splintered off part of the defense picture for special emphasis, has been something far less admirable, far more political—and at times even childish. "They called our boys a nasty name. We'll have to call them one back."

If they stayed within the true boundaries of the association concept, i.e. as a coalition of men seeking common solutions to common problems, they would provide an invaluable public forum. Unfortunately, in the last few years (as the defense budget has gotten tighter), the watchword of too many of these special problem groups has *not* been "How can we help our Service namesake do its part of the job better" but rather "How can we get a bigger piece of the job to do."

Thus, they re-hash in public the same problems the Pentagon struggles with every day unfettered by two military disciplines: (1) their own demands need not be fitted necessarily into the total national defense requirement; (2) they are under no obligation whatsoever to halt the talk and reach a decision. (Indeed, if their particular clientele has "lost" a military debate in the Pentagon, they are *obligated* to keep the argument going.)

Said one disillusioned officer, "They hardly ever alter an adverse (to them) decision. Mainly, they just re-cook the meal several times, long after McElroy has said, 'Let's eat.'" Added another, "One of these outfits is getting together just about every week and if you've seen one, you've seen them all. We do most of the work and they get most of the credit. Sometimes they even appear to be dictating (this particular Service) policy."

Jarred by Hebert committee hearings on Pentagon sales politics, many key defense industries are taking a hard new look at their participation in such goings-on. Said one industrialist, "We've gotten away from the stimulating idea of meeting with military friends, renewing acquaintances. Too much of it lately has been a sales pitch softened with a highball. Our cast is the same, only the uniforms change."

Some military men, too, are growing skeptical. "When we have a military conference, we invariably invite men from the other Services. We gain a great deal of understanding about each other's problems. I don't get much of a kick any more out of going to some hotel pep rally and hearing these guys being cut up."

The sum total of association efforts lately has not been what Defense could use—a true Armed Forces Association. (There are a handful of exceptions to this but, in terms of political power, prestige and patronage, they are relatively insignificant.)

While these splinter promoters prolong the debate, progress drags. If top Service officials, by their own example, would steer these groups out of a prestige contest and back where they would be of real value, the parochial palpitations over who is most important would evaporate, the task of developing a single solid approach to national defense would become almost laughingly simple.

Bill Borklund

Telephone team-up for missilemen...

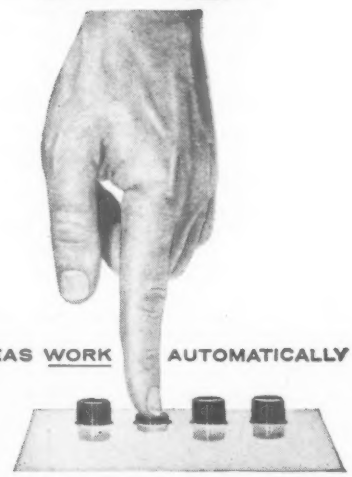
AE CAN DO

Set up a huddle of key figures at a missile base in a matter of seconds? It *has* been done—with sophisticated switching by AE.

The new Automatic Electric 3500-line exchange at Vandenberg Air Force Base makes it possible. Conference circuits can be set up automatically on any internal, incoming or outgoing calls, and a number of men can be placed on the line as the situation demands, with a complete recording being made of the conversation.

Engineers at AE are old hands at switching techniques such as this. That's why AE is well-equipped to solve problems in automatic control for the armed services – and see the job through.

If you have a project in communications or control, AE can assist in the design, and supply the components or complete control packages. For quick results, write the Manager, Government Service Division, Automatic Electric Sales Corporation, Northlake, Ill.



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Washington Background

CAPITOL HILL ACTIVITY, AS IT AFFECTS the Defense department, drifted into comparative quiet in late August. There were relatively few Pentagon legislative roadblocks to a hoped-for Congressional adjournment before Labor day.

TRADITIONALLY, MUTUAL SECURITY AND MILITARY CONSTRUCTION are the last two money bills to weather the lawmakers' storm and 1959 added one more year to the tradition. Mutual Security bill should get through Congress with only a slight (compared to the total request) reduction—just enough to establish Congressional independence of the executive branch.

HOSPITAL PORTION OF THE CONSTRUCTION bill got the guillotine. In spite of the screams of anguish, however, Congress is not mounting a vendetta on military medicine. Reason for the axing is economy. Claiming military hospital costs are "considerably higher" than like operations in other public institutions and the industry field, Congress is really only after forcing a Defense re-study of cost.

ALTHOUGH DEFENSE DOES NOT THINK WHERRY IS THE BEST answer to military housing, politics will probably push it through Congress. (There is a bundle of Texas money invested in the project.) Be that as it may, loan interest rate will go up to possibly 5¼%. Reason: government just can not attract any private capital at 4½%.

BARRING AN UNEXPECTED REVERSAL, the so-called "Tombstone" promotion bill is going through Congress without an effective date extension to mid-1960. In spite of all the press ballyhoo, problem is not really very heady. Item: there are only about 1200 Navy officers from World War II still eligible.

DEFENSE HAD INTENDED TO LET IT run out. Congress wants to end it now (since Navy is the only service which enjoys it). Even in Navy there is far from unanimous joy over the Tombstone promotion rule and, in spite of all the "give us more time" hair tearing, Navy says it can process resignations up to October 15 with no paperwork delay.

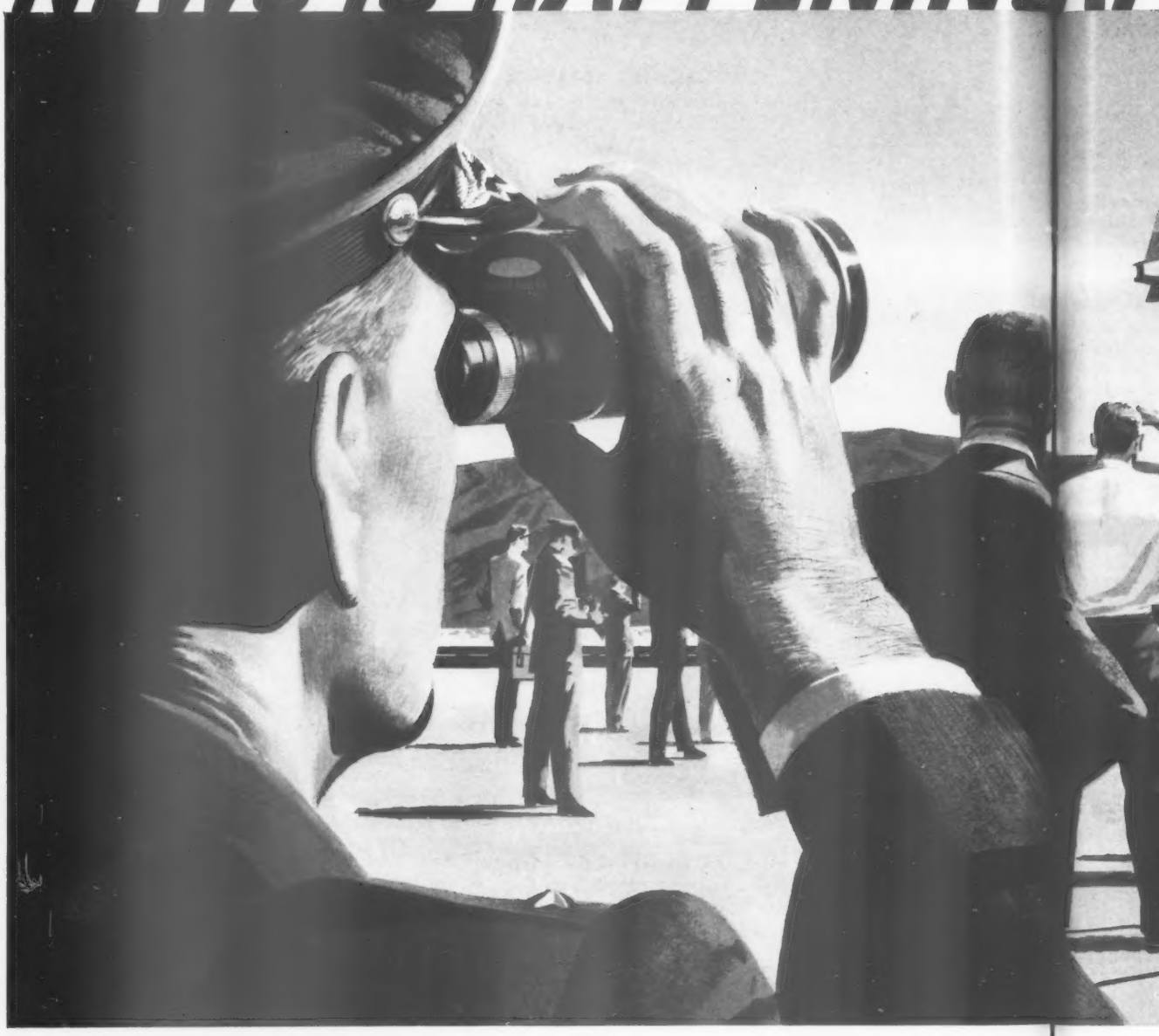
SAID ONE OFFICER, "Whether they decide now or later, it's still going to be just a question of: 'Does a Captain, for instance, due out next June want to resign now and give up about $30 a month in retirement pay for the privilege of calling himself a Rear Admiral (ret.) in his old age?' "

HEBERT COMMITTEE IS GRADUALLY MOVING AWAY from the officer hiring hassle in its hearings, is working into a subject with more substance—the cliche-tagged "munitions lobby." Probable areas of concentration: industry entertainment of officers, military product advertising, industry's role in military associations. The committee problem: separating standard business promotion practices from lobbying and string pulling.

ARMY ISSUED A SPECIAL REGULATION 310-30-15 in mid-August which should quiet the soldiers-being-used-as-servants blast. Although the old regulation wasn't necessarily bad, it left too much latitude for local interpretation, wasn't too clear. New one is very specific.

GOVERNMENT ACCOUNTING OFFICE leaped back into the competition for headlines in late August with nasty comments about General Dynamics' Convair Ft. Worth division overcharging the Air Force some $12 million in 1956. Part that grabbed the headlines (and prompted Congressional threats of punitive action) was hint that Convair had been "uncooperative"—two days after Convair received a letter from GAO boss Campbell praising them for leaning over backwards to assist his auditors.

NEWS IS HAPPENING AT



NOW IN THE AIR–NORTHROP'S N-156F FREEDOM FIGHTER–
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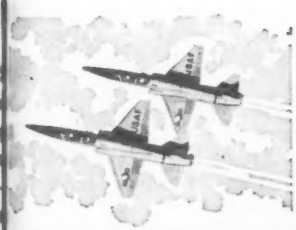
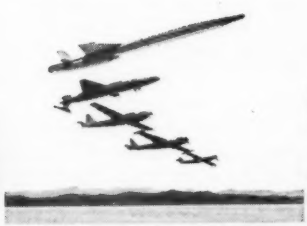
NEWS FROM OTHER MEMBERS OF THE NORTHROP FAMILY

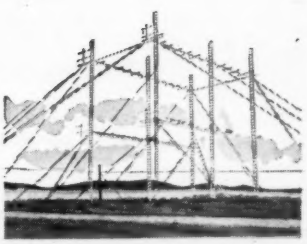


NORAIR produces airframes, space vehicles and weapon systems. In production: Snark SM-62 and the T-38 Talon, first low-cost, high-performance twin-jet to train America's space age airmen.

NORTRONICS makes news with America's 2 most advanced inertial and astronertial guidance systems, LINS and A-5 – is also a leader in automatic test equipment and mechanical ground support.



RADIOPLANE, foremost producer of drones and space age recovery systems, is delivering unmanned aircraft that train men, evaluate today's weapon systems, and fly on surveillance missions.



PAGE Communications Engineers, the leading authority in worldwide telecommunications, is currently employing these advanced techniques to plan and set up networks throughout the Free World.

FAA TO AID AIR FORCE

By 1964, Federal Aviation Agency will be in almost complete control of the Air Force aircraft control job, under present planning. Ground work is already being laid for Project Friendship, which will begin a phase-in of FAA personnel to world-wide AF bases by 1961.

In the Air Force alone, Project Friendship would free some 12,500 military personnel for more critical jobs. The plan will also result in approximately twice as many FAA controllers—nearly 30,000.

To enable the military to have close control over the civilian ACS personnel, FAA is presently working out plans for "a career service within the civil service," which would involve all FAA controllers, maintenance personnel and a skeleton force of managers and other types. One possibility along this line would be something similar to the Foreign Service Officer system used by State Department.

By 1963, FAA expects to control the majority of the Air Force bases. AF will reserve for itself only enough mobile ACS squadrons to handle brushfire situations with new or non-permanent bases. Eventually, parts of Navy, Army and Marine aviation would also fall under the program.

Generally close cooperation is the present hallmark of DOD/FAA relations, with military personnel holding, for instance, 15 of the 40 professional positions in FAA's Planning and Requirements Division.

CLOAK-AND-DAGGER REVOLUTION

In 1956, Army intelligence, with a powerful assist from the Radio Corporation of America, launched a project which shows strong promise of revolutionizing the whole intelligence information processing-evaluating process, has moved far enough down the road now to release a few details. Tagged ACSI-MATIC, the project amounts basically to using electronic data processing equipment to help carry the workload.

Concerned over the time consumed on routine jobs (leaving little time for researchers to study, write reports,) Army, three years ago, was being trapped in a vise—between an unchanged mission-and-functions responsibility and a continuing cut in personnel. At almost the same time, RCA Board Chairman David Sarnoff offered to help, ordered the Sarnoff Laboratories to come up with a report on how to conduct the study.

The result, titled "Study Program on Army Intelligence Problems," came up with two significant answers: (1) The basic problem in intelligence was not retrieval of documents (microfilm's strong suit) but retrieval of significant usable information; (2) RCA said it was perfectly feasible to transfer all information from IBM microfilm cards to a computer.

Army intelligence already knew that searching for information was one of the major time consuming jobs in research. Levering $700,000 in year end funds out of the Army budget, Intelligence asked RCA, in essence, "Prove you can put it on a computer." (They threw the same challenge at Remington Rand, International Business Machines, and Ramo Wooldridge, got little better than a lukewarm reaction.)

RCA did. Project was approved by the Army Chief of Staff in the late spring of 1957, launched on a management engineering contract by management groups (General Bob Ward, Harold Stone) in the Comptroller's office. (Army R & D wanted nothing to do with it.)

Two years later, still living off year-end funds, Intelligence has pumped over $3,000,000 into the project, has come up with such significant results that the entire intelligence community is interested, even enthusiastic, about ACSI-MATIC.

Research analysts now spend about 15% of their time reading, evaluating what they read; 40% of their time just extracting information; 30% of their time manually searching their files; leaving only about 15% of their time for actually writing reports of the results. The 40% probably cannot be reduced but by having a computer type out the information it is predicted that an analyst can put three times more information into a computer than he can now. Big saving will be in searching files which Army thinks it can cut from 30% to 2% of an analyst time. ACSI's goal is to have researchers reading 29% of the time and writing 29% of the time.

One help in the 40% area: IBM has proved that a document can be typed into a computer which will run a frequency-of-appearance word check on a document, give back to the operator an extraction of the main points in the document in order of importance. For the rest of the project, part of RCA's contribution this year will be to develop an analyst's console. Key elements: A closed circuit TV screen so researcher can decide if the information he has requested (using bibliography as source guide) is what he is really after, a button to push in case he decides he wants a hard copy report. In addition, to prevent analysts "having to wait in a cafeteria line" for free time on a computer, ACSI wants RCA to come up with a computer design for parallel operations—to serve a minimum of eight offices at a time.

Although ACSI-MATIC has fought an uphill battle to stay alive (until this year all financing was with year-end funds) Army Intelligence hopes the rest of the struggle will be downhill. Said one officer, "We know, on paper, that the problem can be solved. Now, it's just a question of financial support and hard work."

ARDC REORGANIZATION SOON

First steps in the long-awaited Air Research and Development Command reorganization were in the immediate offing, as AFM went to press. Details of the shift had not yet been revealed by ARDC's Commander, Lt. Gen. Bernard Schriever.

It is expected that last year's Stever Report (see Aug. 1958 AFM) will play an important part in the reorganization. Although major parts of the Stever recommendations would need approval at a higher level than ARDC, such recommendations as functional realignment to replace present geographical organization could probably be handled within the command.

Another point in the Stever report which seems likely to be incorporated in any changes would be to re-shuffle authorities and responsibilities in ARDC to get them both at the same level, and lower in the chain of command. Aim would be to set-up faster decisions.

Another area likely to be changed—in line with Gen. Schriever's thinking—would be to eliminate time spent on product-improvement, with corresponding emphasis on new research. The changes are not likely to force closing of any installations, but functions carried out at certain facilities may be changed.

engine power
BY CATERPILLAR

ANSWERS TO QUESTIONS ABOUT EMERGENCY POWER

Can you be protected against utility power loss?

What can cause utility power interruptions?

Who needs protection against power outage?

What kinds of standby power are there—and which is best for your application?

What things to consider when you plan standby power installation?

THESE are some of the questions you'll find answers to in "Guide Book Information for Emergency Power." Published by the Engine Division of Caterpillar Tractor Co., "Guide Book" discusses emergency power from many standpoints and completely in nontechnical language.

If you are responsible for a business or institution which must have electrical power to safeguard lives, protect equipment or sustain operation—the information in this booklet is important to you. You may obtain a copy, without cost or obligation, by writing to Department 5, Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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What Industry Thinks Of the ASW Problem

Navy has indicated it will need plenty of private industry help if it is ever to close the gap between submarine offensive capability and anti-submarine warfare defense. To find out what industry thinks of how ASW is being tackled, ARMED FORCES MANAGEMENT polled over 130 of the companies, universities, and research laboratories working in the field. An amazingly high 50% answered, in many cases with five and six page documents. Boiled down, their answers show a startling unanimity of opinion . . .

SEVERAL months ago, on a clear spring day in the mid-Atlantic, an atomic submarine made three passes under the protecting anti-submarine warfare screen of a Navy Task Force. Each pass was undetected by the surface armada.

At almost the same time, Chief of Naval Operations Arleigh Burke tagged ASW "a number one priority" problem of the Navy. While he was talking, a report from Defense Department's weapons system evaluation group was quietly circulating the Pentagon, reportedly indicated that both present and planned capability for ASW (as related to nuclear submarines) is totally inadequate—particularly in the detection, identification and tracking areas.

Shortly after that, Navy launched a concerted program to educate the public in general, and the Congress that could give them the money, on the Russian submarine threat and our own woeful inadequacy in ASW. Their message in essence: To solve the problem, permit average-speed ASW progress to attain the meteoric speeds of submarine development itself, was going to require an effort as great as the one needed in this country to develop the ballistic missile.

After a brief (one month) flurry of activity, all conversation on ASW died down. Other than a slight Congressional concern, Navy got nowhere. When Burke announced last month that the Navy had reason to believe Russia now has a missile launching submarine, it stirred hardly a ripple on the surface of U.S. composure. Thus, Navy is about where it was last spring, still must face the chief roadblocks to ASW progress it has always faced—lack of funds, lack of push from sources other than Navy.

It appears likely, short of Russia dropping a submarine launched missile on New York, that this, in relative terms, will always be the case. Thus, how well Navy does on the project is going to depend to a very large extent on how well resources are managed. An important segment of that resource is defense industry, about the only audience of Navy's plea for help which has responded enthusiastically.

To find out what they thought of how the program is being managed, ARMED FORCES MANAGEMENT mailed a questionnaire to nearly 140 of the blue chip industrialists who have committed a large portion of their effort to ASW. Their reaction basically: "We've gotten dressed for work but the boss doesn't quite know what to do with us." Their criticism more specifically: "Our real ASW problem is a lack of real coordination, management control. The reason: The inability of the Navy to recognize ASW as a problem of itself, tackle it as something apart from the entire organization. From an organizational standpoint it is probably fair to say Navy has never faced anything quite so complicated."

Leadership Lacking

In their answers to the questionnaire, industry went one step further, recommended what they thought was needed to improve this coordination and control. Nor can industry's opinions be discounted as a reaction of not getting enough contracts. Closer to the military than it has ever been in peace time, industry's nearly unanimous reaction to the questionnaire rules out any element of partisan salesmanship.

The point: Industry believes that up until now it has been a largely misused and/or misdirected resource. It is looking to Navy for leadership and not getting it. Said one company president, "There is no one man or central office which can say, with authority, 'This is good or that is bad.'"

Boiled down, industry believes Navy must obtain: Money; a central information center on what is being done by all the other organizations working in the ASW field coupled with a relaxation of the present need-to-know policy; and, for many firms, what would be even better, an ASW Project office.

Taken in order, this is the industry belief and the Navy answer:

The need for spending more money on ASW is fervently endorsed by Navy. But, as Navy usually quickly points out, it is equally evident that more money spent on ASW might be detrimental to other Navy requirements—particularly in these tight-budget times. However, industry is not entirely satisfied with this answer.

Typical of the comments: "It appears that the R&D budget the Navy is receiving for ASW work (approximately $174 million) is not commensurate with the magnitude of the problems to be solved nor is it consistent with the

amount of interest they have attempted to stimulate on the part of contractors to help solve their problems."

Said another: "However, along with the assignment of high priority, there has been no corresponding assignments of funds. If anything, this has created a worse situation than before. Since the priority has become generally known, the relatively small number of Navy people charged with the responsibility in ASW have been swamped with proposals and inquiries and have very little money with which to do anything." An additional wrinkle: "Although we talk millions and millions of dollars for ASW, very few of these dollars actually go to support development and experimental work on new ideas and new systems."

This problem is compounded, of course, by the fact that most of the money on ASW is spent by the bureaus. Basically, the bureaus take fundamental knowledge and apply it to military weapons. However, so little is known about the basics in ASW (oceanography, sound transmission, etc.) that many firms are convinced the whole project is groping in the dark, is unlikely therefore to come up with a real breakthrough—and operating elements at sea are the first to admit that today's equipment is not giving them the answer they need.

This problem was outlined best by a large research laboratory which said, "There seems to be inability to support investigation of many of the really basic problems confronted, and to much pressure to use funds for gross systems developments. These systems are predicated on knowledge which simply is not available, but which could be obtained if government organizations were allowed more freedom in looking at the basic phenomena involved. One good example is the question of understanding scattering of sound in the ocean."

The industry money wrap up: "It is a historical fact that each year lip service is given for increasing the level of ASW effort. This lip service stems from all levels, including Congress. Appropriations, at the Congressional level, have not been assigned which are commensurate with the depth and importance of the submarine problem. This basic mistake has further compounded by dissolution of ASW funds, as the money appropriated is channeled through the Department of Defense to operating levels."

Central Information Office

"There is no central functional agency in the Navy Department responsible for the overall ASW coordination. It is more or less divided between bureaus and independent activities and hence, there is no central source of authoritative information in all facets of the ASW problem." In other words, says industry, each activity, and they are spread all over the lot, is cooperative and helpful; but there seems to be a dearth of communication between them.

A great deal of information that is available by talking directly to specialists at various installations has not been published nor has it been transmitted to people who should be knowledgeable in the program from an overall standpoint. "To improve the ASW effort, one recommendation I would make is that the Navy establish an ASW Information Center in the Washington, D.C. area."

It must be recognized that in recent years there has been a greatly expanded industrial effort in the ASW field due to the high priority placed on the problem. The number of technical specialists in the ASW field is extremely limited as is research in oceanography, underwater acoustics and other pertinent technical areas. Even so, Navy itself has recognized the fact that technical information has been hard to come by by industry. In the last two months they have issued a request to all concerned Navy agencies to do everything they can to let down the barriers on information classification, but red tape and lack of personnel being what it is, any solid results in this area are going to be a long time arriving.

Number One Headache

In the meantime, "Our biggest single headache *is* in establishing a 'need-to-know' security agreement. ASW, perhaps, more than any other single effort within the DOD is overburdened with security."

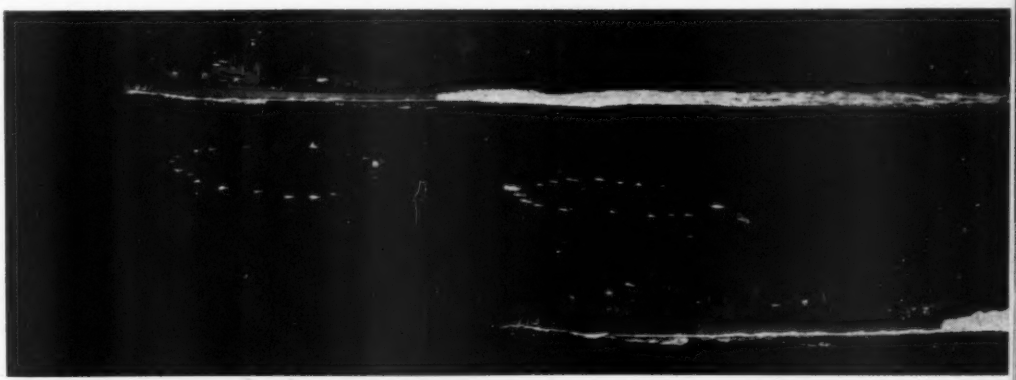
This problem becomes particularly acute for companies anxious to get into the business but not already possessing Navy contracts. Because industry is pushing a very big effort, particularly in the crucial R&D area, there are many firms now in the field which Navy has not been able to survey. Thus they have organized the trained key personnel at company expense, been so far unsuccessful in broadening their information and experience base to determine where they could best contribute.

Said one, "A more direct effort by the Navy in dealing with contractors would eliminate duplication of effort on the part of industry. For example, a great deal of unsolicited work has been done by industry which, upon review by sections within the bureau is returned to the contractor with comments to the effect that the work proposed has already been evaluated or is being evaluated."

This proposal leads naturally into the next, and most frequently suggested solution—an ASW Project office or something similar.

Said one laboratory, "One of our largest problems in dealing with the Navy on anti-submarine warfare is that there is no single group within the Navy Department responsible for the entire anti-submarine field. Thus, it is difficult for a contractor to anticipate or indeed discover the total needs of the service in this area.

"We feel that the anti-submarine warfare effort could be improved by establishing a central anti-submarine war-



Hedgehog depth charge pattern, as shown here, is good example of World War II tactics and equipment still being used in ASW work.

much work is needed . . .

fare group—perhaps along the lines of the Bureau of Ordnance Special Projects Group which would be responsible for the anti-submarine warfare effort of the service."

Among the reasons: "Right now each group is working on its own specialty. The sonar men are making more and better sonar; the sonobuoy are making better sonobuoys; the radar men are making better radar; etc. The operational people are trying to tie together a 'hodge-podge' of equipments and work out tactics that best use the equipments." (Thus equipment tends to determine tactics rather than the other way around.)

Many companies find they are contacting, or must contact, frequently hundreds of Navy personnel to obtain a few answers. Pleaded one: "The biggest headache in dealing with the Navy is its lack of organization in the ASW field. Responsibilities are ill-defined, and ONR relationships between the bureaus are obscure. The Hudson laboratory tie-in to ONR, NRL and Bureau of Ships are so mysterious as to defy description. A clear organization chart on a Navy-wide basis outlining ASW responsibilities would be a godsend."

Without a clearly defined responsibility in the ASW area, industry has frequently bumped into the problem of a lack of consistency among many Navy agencies as to what the requirements of the Navy really are in the ASW area—or so they claim. Said one university engineer, "Some false starts have been experienced and valuable research and development efforts have not always been carried through to an economical and satisfactory conclusion." Added to this, many firms have found "there is almost a complete lack of continuity in the Navy's technical programs. The effects this can have are obvious." Even Navy personnel imbroiled in the ASW problem have sometimes felt as one captain who said, "Sometimes I am convinced we are not pulling together as well as we should. Each bureau, office and agency assigned one particular piece of the problem runs off into a corner with it. No one is looking at the total picture who has any real authority."

Part of this, of course, is inherent in the organization which, as one laboratory president stated, "Does not have clearly stated objectives, lines of commands and responsibility and all the other associated ills that normally plague a large organization."

But, there are signs that the Navy, in the gradual evolution of streamlining its organization, may eventually answer part of this headache. The planned establishment of a Bureau of Weapons should help considerably but this is at least a year away from being launched as an operating organization. Best hope in the meantime for a solution of the organizational problem is offered by the newly established Office of the Deputy Chief of Naval Operations for Development headed by Vice Admiral J. T. Hayward.

Particularly once his new office is fully staffed, Hayward is in a fine position to improve coordination and management on the project. His undersea warfare branch, headed by Captain William H. Groverman, already has managed to give some firms the broad aspects of the problem, steer them to logical contacts within the bureaus and ONR in their fields of interest. Thus, they are in the best position to be a central agency for the ASW problem but, here again, until the organization is in full operation, there are going to be delays.

Navy says there would be an immediate improvement in ASW capability if Navy could modernize its present ASW Task Forces. However, they also state that a devastatingly effective solution to the problem will not come until there is a breakthrough in the R&D area. And very simply, Navy has moved slowly in this field because of the lack of basic knowledge, and understandable lack of interest in committing themselves until they have some idea of what the best direction to move is.

Said one officer, "If there was a clear cut system which we knew we could develop which would solve the problem, we would have no headache. It's not like building a missile or putting a missile in a submarine. There just is no obvious answer. In the meantime we have to do the best we can with what we have, constantly trying to improve it, and hope we can get a breakthrough."

Industry's answer is that without a better organized program, a breakthrough is highly unlikely. One of the Nation's largest industrial firms checked off what they believe are the answers this way:

1—Concentrate the decision making and the available funds by cutting down the number of interested Navy agencies. This should produce a better integrated program and improve liaison with the fleet and interested contractors;

2—Streamline internal Navy procedures and paper work. This would reduce the time between proposal and contract and improve the contractor's readiness and planning;

3—Have the Navy laboratories concentrate on the work they are best equipped to do, such as sound propagation and oceanographic research. Let industry be responsible for design of specific equipment from its inception;

4—Apply funds in keeping with the scope and importance of the ASW problem and apply them for sufficient duration to reach objectives;

5—Provide a broader interpretation of industry's "need-to-know" in connection with classified material such as laboratory reports and research development.

Summing It Up

In summation, industry says, "The situation calls for an ASW project organization with clearly defined responsibility to provide ASW equipment of the types needed and undiluted authority to execute the essential material programs.

"In the organizing, training and equipping of composite ASW task forces, the weak link is clearly equipment. This is the area in which industry could help."

Although they were quite strong in their recommendations, industry was equally quick to point out that the ASW headache is not entirely the Navy's fault. Typical of the comments:

"The Navy's accomplishment with the limited funds available for its many activities have been very well used indeed. When it's considered that the Navy maintains one of the largest Air Forces in the world, that it has to police the greater parts of the world's oceans, that its submarines are very highly advanced and that the exploits of its nuclear submarines are prodigious, that its progress in electronics, weapons and nuclear propulsion missiles, and all of the other component activities of this highly diversified organization are in the forefront of scientific development, I think you will agree the Navy's accomplishments with its limited funds are remarkable."

But industry is convinced Navy is not using to best advantage all the resources it could have available. The organization is gradually moving into a better position to handle men, money, material more efficiently but this is going to take a considerable amount of time. Top industry officials, a great many of whom have been at sea with ASW task forces, returned believing as one industry engineering vice president who said, "The operating elements at sea are a dedicated bunch. Unfortunately, help from the shore establishment has not been all it might."

Can You Become A Space Age Executive?

By Mr. E. D. Dwyer
Chief, Navy Management Office
Navy Department

"Direct your interest and attention to the difficult, the rare, the significant, the problems—the EXCEPTIONS"

NUMEROUS management techniques and devices because of their very name, the way they sound to the ear, or their first impression on our thinking process seem to carry a non-deserved significance as being "mysterious and vague." This connotation was particularly true with respect to Data Processing when speed by electronics leaped into prominence in business administration. Equally true in its early days was the lack of understanding and limited use of another tool of management in the decision making process—*Management by Exception.*

Management by Exception is not new. It was used in the days of the Pharoahs to relieve the pressures of decision making. Since that time the principle has been applied by man on many occasions from the management of his livestock to the accounting for his personal earthly possessions. Today its use is receiving accelerated inpetus throughout Navy—and rightly so.

Before exploiting the vast potential of "management by exception," however, let's very briefly summarize *How* it became an acceptable technique in directing Navy's broad programs and those of lesser degree, and *Why* its maximum application must be an integral part of future management information systems.

For quite sometime, key Navy executives have emphasized the importance of reporting by exception and established standards to eliminate reporting except in cases where standards were not met. It was no doubt known at that time that the progressive changes taking place would soon remove the manager from his pinnacle of having to know everything that was happening. A vision of technological advances to come made it necessary that the Navy manager prepare himself for the remote future—TODAY. Too much would be happening for him to know all about every aspect of the job. He must be able to concentrate on what was above or below standard and what was not going according to schedule or plan. In brief, he must be prepared to evaluate certain information furnished to him for timely action. In fact, the Navy manager was being told just this: "If the information being reported to you doesn't surprise—*it is not needed.*"

After reading this article, most of you will agree that these principles should be adopted by all of us immediately. Yet few of us will. If you don't think you are in the foot-dragging category, put yourself to this test:

1—Do you continuously provide your superiors with information that indicates to him you are or may soon be in trouble—so he can be prepared to help bail you out if you need it?——

2—Are you helping to free his time so he can handle the difficult case?——

3—Are you sending him only the unusual and rare cases?——

4—Do you have a well-devised plan and report to him on the changes only?——

5—Are you spotlighting in your reports only those facts which are of special interest to him or his level of management?——

no time for nit-picking . . .

Managers, whether occupying positions in government or in industry must plan, direct and evaluate work. To adequately do so, information reported must be meaningful to permit accurate decisions and timely action. The diversities that arise without warning, the complexities that virtually seem to explode all about him and the myriad tasks which cannot be deferred literally demand that the Navy manager resort to management by exception. *It is the rule* whether allied to administering a major segment of a weapons information system or directing a program of lesser importance. Time is of the essence and the most important factor for survival. Of course, management by exception cannot accomplish the impossible. There first must be a "best possible" plan, schedule, standard or goal from which there can be an exception.

If plans are carefully made and goals realistically established, managers should be notified at once when actual performance deviates from the goal beyond predetermined limits. In this way, the manager's work volume is curtailed, efforts can be devoted to the "exception" and more time will be available for the total job of managing. When the principle is adopted by all levels of management, only the rare and unusual exceptions will ascend to the manager for his attention, since corrective action will have been taken on those other exceptions while coming up the pyramidal chain.

Types of Exceptions

The Navy considers four principal "exception categories" which are normally encountered in the business cycle. They are:

1. The difficult case
2. The rare case
3. The action case
4. The significant case

1. *The Difficult Case*

In cases of this type there is no quick and easy way to reach a decision. Usually, many highly variable inter-relationships must be evaluated. All too often much of the top management effort is consumed in processing voluminous routine information, such that adequate time is then not available to properly weigh all the factors in the complex cases.

This, then, is an area where management by exception can relieve management of much of the routine decision-making, assuming that management first establishes the proper set of factors and their relationships upon which the lower echelons will base their decisions.

2. *The Rare Case*

In some instances management has endeavored to provide for internal processing of every type situation, regardless of how unusual the conditions or how *rarely* it would appear in the cycle. This is extremely costly and time-consuming. Therefore, the rare case should indeed be the exception that is selected out for special handling. Again management must first establish the proper factors upon which the lower echelon will conclude that the case is rare.

3. *The Action Case*

It is on the basis of periodic reports that the manager makes most of his evaluations. The reports are in essence the by-products of a properly directed and well devised plan. Some functions, notably in the fields of personnel and material inventory accounting, involve tremendous volumes of data which are periodically reproduced in report form. The very size of these reports precludes their having any real benefit for enabling timely decisions.

In these instances the exception technique should be applied in the compilation of the report to insure that those elements which have undergone change are recorded. This procedure provides more meaningful and useful reports, in the form of summaries of stock movements, personnel acquisitions or transfers of material, etc.

4. *The Significant Case*

The significant case relates to spotlighting occurrences which would be of special interest to management in terms of high dollar value, involvement of critical materials, accelerated expenditures of funds, etc.

All levels of management should function within the concept that reporting should be up through the chain of command beginning with the lowest decision level with referral to higher echelons, in summary form when possible, of just the exception data requiring special analysis. In this manner, the task of screening great volumes of data, which in itself does not constitute a basis for decisions of major scope, will not dissipate the valuable time of top management.

Future Assured

It is absolutely essential both in government as well as in industry that the manager free himself from the inadequate in day-to-day operations. This is especially true within the military departments because of the requirement imprinted by the complexities of modern weapons.

Complicated problems resulting therefrom seem to grow as fast or faster than jets zooming across the horizon. These problems demand timely and decisive action. Here is where Management By Exception can assist the manager in his new job of managing.

Its greater acceptance is not novel since it has long been recognized as a "common sense" approach—a tried and proven conventional technique of management improvement. Soon, Management By Exception will be acclaimed as one of the noteworthy techniques of efficient space-age management. It should *NOW* be a rule of conduct at all levels of organization rather than an exception. When employed to its fullest, reporting systems in the future can be a rather simple process.

What Do You Do?

After reading this article most of you will agree that these management by exception principles should be adopted by all of us immediately. Unfortunately there are very few of us who will actually put them all into effect.

We are bound by the traditions, methodology, experiences, and cliches that we lived through in the slow-moving period before and during World War II. And even more importantly, we want to continue to take up most of our time with our superiors convincing them how well we are doing our job. We can't continue to do this and adopt these management by exception principles except to a limited degree.

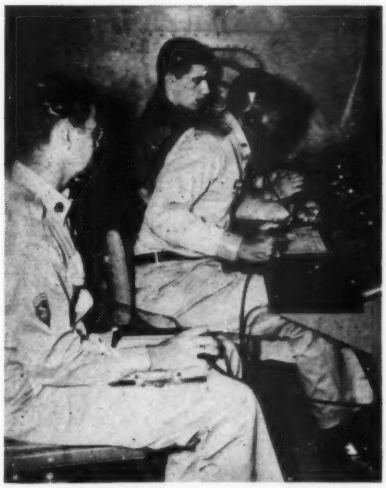
If *you* don't think *you* fall into this category, put yourself to a test! Do you continuously provide your superiors with information that indicates to him that you are or may soon be in trouble so he can be prepared to help bail you out if you need it? Are you helping to free up his time so he can have adequate time for decision making on the "difficult case?" Are you sending him only the rare cases?

Do you have a well-devised plan and report to him on changes only? Are you spotlighting in your reports only those occurrences which are of special interest to him or his level of management? If you can answer yes to all of these questions, then you should stand up and be counted. You have the makings of a space age executive! It would be worthwhile for you and only you to read this article, digest it, and put all these principles into effect.

Proficiency Testing:

A Tool for Training Management

by Dr. Robert G. Smith, Jr.
Senior Scientist, US Army Air Defense Human Research Unit, Fort Bliss, Texas



Simulated alert is conducted by Battery Control Officer, as part of the eight-part proficiency testing program.

IN TODAY'S Army, one of the most important and pervasive activities is that of training. When we add up basic military training, technical training, and on-the-job training, it becomes very obvious that a tremendous amount of time, money, and effort are being spent on training.

Those who manage training programs must have at their disposal accurate means of measuring the total effect of their training effort. If they do not have such measuring devices, they will never know whether their training is accomplishing anything.

One very common way of evaluating training is to examine the paper work associated with the conduct of a training program. An inspector will look at the training schedules that are posted on the bulletin board, will call for and examine lesson plans, and often find that these are the only evidence he has as to the effectiveness of a given program of training. However, since the purpose of training is to change the behavior of the trainee, it is clear that a training program may look good "on paper" and still not develop proficiency in the trainees.

For these and other reasons, it is becoming increasingly clear that the best way of measuring the effectiveness of a training program is to administer a job oriented proficiency test to the graduating trainees. This proficiency test will constitute a sample of the important tasks which the trainee will be required to perform on the job.

The program of training research carried out for the Army by the Human Resources Research Office of The George Washington University has repeatedly shown the value of such tests. In various research studies, tests for evaluating trainees had to be developed to measure proficiency in firing a rifle while masked, repairing tank armament, receiving a Morse code message, operating a radar set, and detecting targets from the air, for example.

The purpose of this article is to describe the development of a job oriented proficiency test for Nike Ajax platoon leaders. Although the use of these techniques is expected to provide significant information of value to trainers in the Air Defense Program, our main interest here is in presenting the techniques as an example of what can be done in the way of developing job centered proficiency tests. The work described here is part of the research program of the U.S. Army Air Defense Human Research Unit, a part of HumRRO, whose unit chief is Lt. Col. Frank J. F. Polifka. The over-all direction of research on Air Defense problems is under the guidance of Dr. Joseph C. Hammock.

The impetus for the development of the proficiency test for Nike Ajax platoon leaders came from a request by Army Air Defense officials to the Human Resources Research Office for research to determine the level of skill and knowledge required of Nike Ajax officers.

The initial stages of research took the form of preparing a complete description of the job of Nike battery officers. The researchers observed and interviewed Nike battery officers in the field situation. As a result of this experience, they developed a provisional list of the duties and tasks of the Nike Ajax battery officers which were then further checked by focused interviewing with appropriate field personnel. The complete list of job requirements was converted into a check list which was administered to field experienced Nike Ajax battery officers. Each job activity was evaluated for its importance, required proficiency, and training priority level.

These evaluations were summed in order to obtain an over-all description of training needs. Those activities that were in the upper and middle third of the training need distribution were emphasized in the selection of content for the proficiency test.

When the complete list of job ac-

can you rely on the man doing the job . . .

At missile inspection station, an officer indicates one point that must be checked out by man being tested.

Operator Evaluation station is run with the officer on the left checking for the operator's errors.

tivities had been rated, it was found that the following activities had been emphasized: Determining the operational readiness of fire control and launcher area equipment; training and evaluating radar operators and launcher crewman; organizing and administering the fire control and launcher platoons; and performing as battery control officer and launcher control officer.

The test questions and procedures were then developed with the aid of technical experts and the appropriate technical manuals. The content of the test constituted a sample of the important activities which the Nike Ajax platoon leader was required to carry out. Considerable care was exercised to make sure that the directions were consistent and that the problems given to the officers were as realistic as possible. A very important aspect of the test was its emphasis on scoring the actual performance of the platoon leader in carrying out these important duties.

The Eight Parts

The test was organized into eight parts or stations. Each station is independent of the other so that the test can be given in a round robin fashion. Each officer who takes the test starts at a different station and then moves around the circle until all stations have been completed.

The parts of the tests are named as follows: Station 1, Operational Readiness Checks; Station 2, Battery Control Officer; Station 3, Operator Evaluation; Station 4, Launcher Console Panel and Operation; Station 5, Missile and Launcher Inspection; Station 6, Missile Servicing; Station 7, Extra Duty Assignments; Station 8, Platoon Administration.

I would like to describe in more detail some of the techniques that were used to obtain test procedures that were highly realistic in terms of performance on the job. In Station 2, which covers the Battery Control Officer position, the officer is required to go through an alert sequence which culminates in the simulated firing of a missile. By a simple modification of the actual Nike equipment, a "hostile" target is fed into the radar observed by the officer being tested. The various operators provide him with information in accordance with a carefully prepared script. The officer is scored on both the speed and accuracy of his performance in the important job of battery control officer.

Station 3 is concerned with the ability of the officer to evaluate the proficiency of his assigned operators. In this test, a skilled operator is taught to make certain mistakes while conducting his various checks and procedures. The officer is judged on his ability to detect these mistakes and to indicate the correct procedure.

In Station 5 the officer is required to inspect an actual missile. He must demonstrate that he knows the location of each check to be made and the correct indication that the missile is serviceable.

In Station 8, which concerns platoon administration, the officer is faced with a series of problems which are placed in an "In Basket." His warrant officer and platoon sergeant are not available for consultation on these problems. He must examine the material in his In Basket, organize it, decide on a correct action to be taken, and answer questions concerning the action selected.

Reliability Gained

The proficiency test has been administered to 120 officers just prior to their graduation from the officer basic course of the Air Defense School at Fort Bliss. It has also been administered to the platoon leaders of the Washington-Baltimore, Boston-Providence, and New York defenses. It is expected that the comparison of the performance of the various groups which were tested will yield much information of value to training officials.

The research has already yielded some by-products which have been found useful in Air Defense Training. Both the Air Defense School and the 1st Guided Missile Brigade have ordered reproduction of the officer job descriptions. The descriptions have been useful in clarifying training objectives and in providing students with a clear picture of the duties they may expect to perform upon graduation.

However, the most significant result of this research may be the demonstration that it is possible to evaluate in an objective and reliable way training outcomes which are based on the performance of highly complex jobs involving administrative decisions, evaluation of equipment and personnel, and the performance of complex alert routines.

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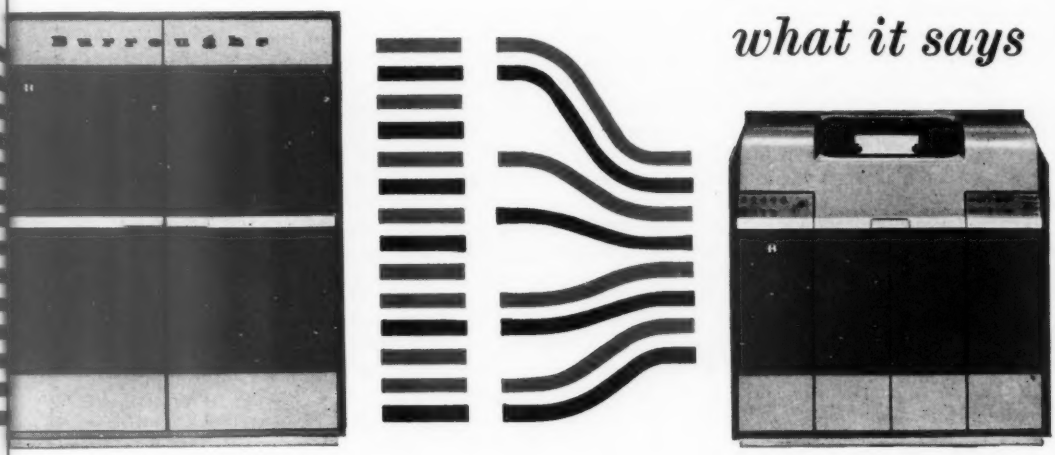

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Black Saturday at BMD--Part II

Most Important Tool: Management Analysis

Last month, author Getz outlined the organization of the Air Force Ballitsic Missile Division, told how its Management Control System is set up, and how and why its control room operates as it does. This month's story conclusion tells how the team functions when the warning light flashes "Black Saturday."

by Lt. Col. Charles W. Getz
Chief, Program Analysis and Presentation
Air Force Ballistic Missile Division

THUS far, we have determined that we have two committees, Program Management Representatives, and a control room with centralized and detailed records. Just about this time a logical question might be "So what?" Most control rooms contain many charts and records. What makes this one any different?

The real difference is that we are discussing a management control *system* . . . and the control room committees and records are only *elements* of that system. How we make use of the records in our program management is another important element of the system, and the methods come under the general heading of *management by exception.*

In our MCS, what we mean by exceptions are such things as actual figures which deviate from a projection; in other words, any deviation from the plan. With thousands of milestones and other records, the staff could not give their attention to what was progressing according to plan—unless they were changing the plan. We were literally forced by the weight of the program to concentrate on the exceptions.

Of course, when you lay out a program in terms of thousands of milestones by month for several years in advance, it is impossible to predict accurately. If there is danger—and this is frequent in such a complicated research and development program—the staff must have the ability to rapidly correct the problem.

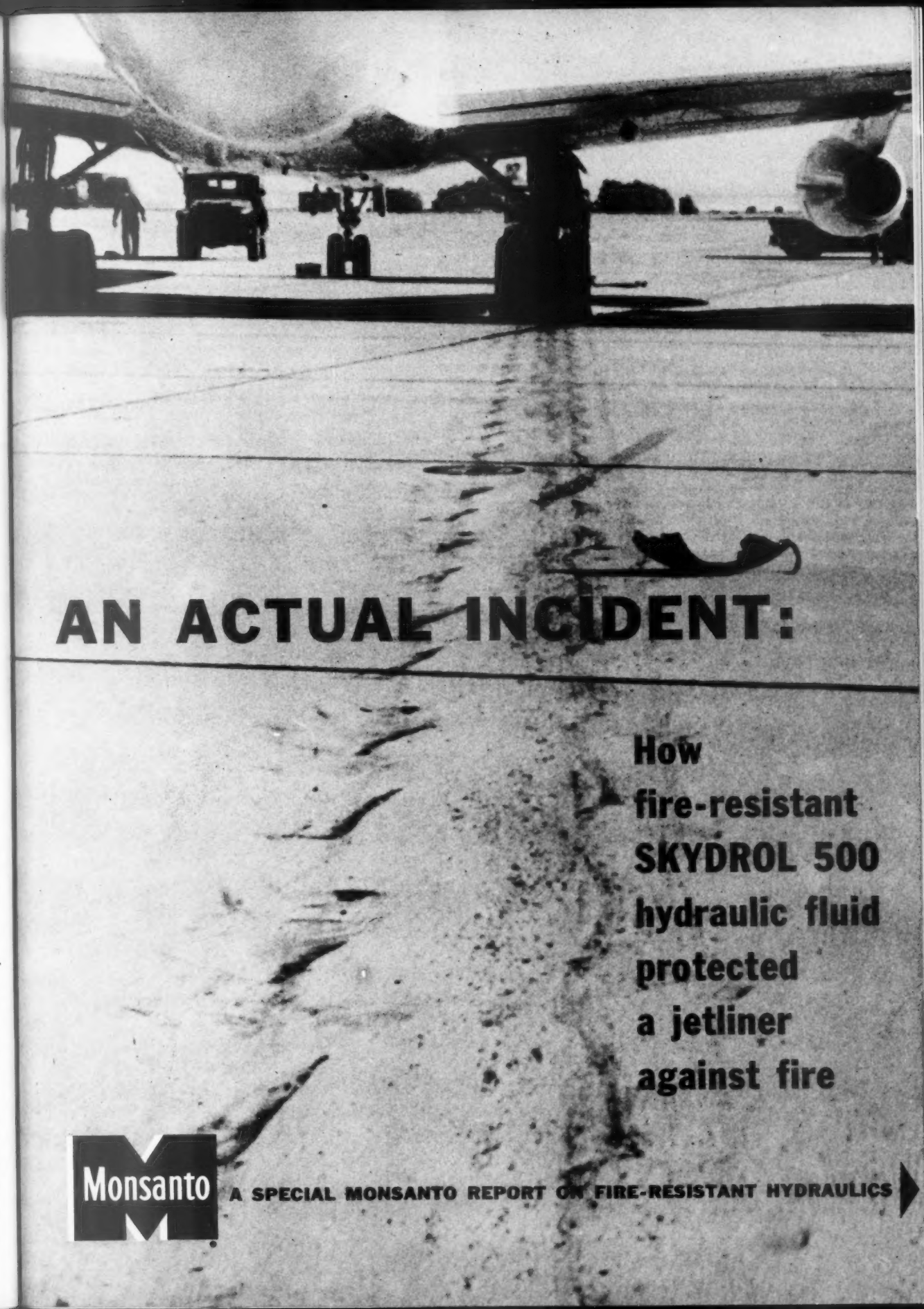
Although an old management adage says that *"identification of a problem is half its solution,"* it should have continued by saying *"and the other half is action."* The ability to recognize a problem and, more important, be able to do something about it is nothing more or less than *management analysis.* Analysis is an intrinsic function of every staff office. There are several central staffs in the ballistic missile team that analyze exceptions, but the important analysis is done by the operating staffs: the joint project offices responsible for managing the various parts of the team's mission.

Obviously, not all *exceptions* are discovered through the types of records in the central reservoir. In addition to the data described last month, our contractors provide narrative technical and management reports which permit our team to evalute program progress. However, the intent here is to describe the system established primarily for internal management team purposes, although no fine line can be drawn between the two.

Sometimes *exceptions* are of such major importance that a completely new set of records must be developed where, originally, only a few items were recorded. An example: the activation of a major missile launch complex. There was a question as to whether the complex would be completed in accordance with the very tight schedule. Many different contractors are involved in completing such a facility. In addition to the "brick and mortar," there are miles of cables, hundreds of instruments, control consoles, just to name a very few of the major items.

From the close supervision maintained by the management team, it became apparent *in time* that the facility might not be available when needed. In conjunction with industry team members, many hundreds of detailed milestones were developed . . . frequent meetings were held with all

This is *Black Saturday*, the top level management briefing at BMD. Among those attending are Dr. Louis Dunn, STL President, Maj. Gen. Bernard A. Schriever, Maj. Gen. Ben I. Funk, Brig. Gen. William R. Large, until recently Assistant Commander-in-Chief, Strategic Air Command (SAC-MIKE).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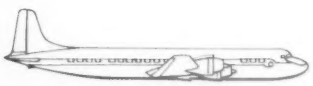

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military/engineering/industrial team members . . . problems were identified . . . action outlined and directed . . . and careful records of all proceedings were kept for the information of all action agencies. The launch complex was completed on schedule. *Identification of the problem—action to resolve it. This, then, is the secret of the exception principle.*

Review Meetings

Inherent in the Management Control System are meetings for the primary purpose of reviewing program status. These meetings are formally scheduled, recurring gatherings of team members wherein each functional program area is reviewed to reach a coordinated and authenticated position on program status. Such meetings are also important to top management for overall review of progress and problems. The principal internal management meetings at MCS are:

Weekly Commander's Staff Meeting

The principal purpose of this meeting is to provide a systematic method of reviewing current management problems and tasks so that timely decisions and orderly progress can be made. One member of the Air Force Ballistic Missile Division staff is responsible for providing weekly "highlights" of activities for the information of the staff. Held in the *Program Review Center*, the meeting is not unlike similar staff meetings held by other organizations.

Monthly Staff Programming

The Monthly Staff Programming Meetings were originally established in 1955 so all team members could review and authenticate their program charts in the *Program Review Center*. Although some of these meetings still retain this original intent, others have changed in flavor, due to the rapid increase of data and the necessary introduction of high speed electronic data processing equipment. Scheduled each month by the *Program Review Center* staff, these meetings are exclusive of the many other internal team meetings that take place during the month.

Weapon System Team Meetings include all personnel from all organizations at Inglewood who have a responsibility with a particular weapon system. Activities during the preceding month are reviewed along with planned objectives for the immediate future.

Major problems are discussed and action agencies designated . . . contractor performance is evaluated and discussed . . . the agenda for the Commander's Internal Management Conference (see below) is developed . . . authentication—in the form of signatures of responsible team members—of Program Schedules and Data Books is obtained.

Technical and Project Staff Meetings are similar in purpose to the weapon system team meetings described above. Each subsystem team, (propulsion, guidance, etc.) system test team, and space project team conducts a monthly review of its records.

Support and Administrative Staff Meetings are held to review and authenticate their records. As most of the records in the support category are on full size *Program Review Center charts*, the meetings are conducted much as they were at the beginning of the MCS in 1955.

Black Saturday

"Black Saturday" is the name applied to the Commander's Monthly Internal Management Conference by the local personnel. Historically, the Conference was begun in 1955, is the senior team management meeting during the month. An all-day program review for the Commander, Air Force Ballistic Missile Division . . . the President, Space Technology Laboratories . . . the Commander, Ballistic Missile Center . . . and the Assistant Commander-in-Chief, Strategic Air Command (SAC MIKE), the meeting is also attended by key staff members of the entire management team.

The people who are responsible for managing the program, for determining the data to be placed into the central reservoir, for authenticating the records, are the people who get on their feet and brief top management on the progress in their areas of responsibility. Emphasis is placed on major problems.

Although this is not a problem-solving conference, many decisions are made and action directed. After Black Saturday, the action items are published and followed up by the same staff that is responsible for the Program Review Center operation. The major part of the conference is devoted to the weapon system presentations. As many as five or six speakers will talk on one weapon system since the conference is conducted on a team basis. Very seldom are they from the same staff office or the same organization.

Black Saturday is important to top management. It is the only time during the month that they learn how the total program is progressing. For management control, however, the importance of the conference occurs before the meeting ever begins. To survive and be effective, a management control system must receive continued and strong support from top management. The support must also take some physical form for all to see. Black Saturday is the physical representation to all management levels that the MCS is supported and desired by the senior managers.

At the meetings, the senior team members insist upon the use of common records resulting from the central reservoir of data. They demand a reasonable degree of standardization between team presentations which, in turn, requires standardization in the records of the *central reservoir of data.*

Since the Black Saturday presentations are made on a team basis, this requires agreement within the team on the status of the program. Infrequently, the team will not agree on some major point, and this becomes obvious at the Conference. When this has happened in the past, directed action from the top team at the conference has alleviated the problem and brought the team back into harmony.

Central Publications

A number of publications are prepared from the central reservoir records. Each is designed to satisfy a particular need of program managers, be they top level managers or project level managers.

Program Schedules and Data Books

By far the most widely distributed internal publication is a series of volumes called the Program Schedules and Data Books. There are presently seven volumes. The books are a run-off in one form or another of all central reservoir data, including machine-prepared data and photographs of full size charts. These books are considered the official internal working documents of the program.

Weekly Status Reports

What may seem strange and rather amusing is the fact that a large percentage of the personnel at the management installation in Inglewood first read about a missile flight test in their morning newspaper . . . much the same as the general public.

However, it is helpful to many offices to have summary information on what flight and captive tests are planned for the future and the results of tests to date. The *Program Review Center* staff publishes such information in summary form. It is a weekly re-

port in a simple "easy-to-read-in-a-hurry" format. It tells the staff: What missiles, by number, are in the factory nearing the shipping date; Missiles in transit to test sites, in Florida or at a test site, and in which hangar or on which test stand they are located; Planned launch dates or, in the case of captive test missiles, firing dates; The results of previous tests.

Special Analysis Publications

It is apparent that the availability of so much program data from a central reservoir—particularly with the data in machine processed form—provides an excellent opportunity to perform certain specialized analyses for the staff. Previously mentioned was the ability to "machine analyze" the milestone records.

The information is printed out by the machines for the use of the responsible managers, saving them hours of detailed review. In essence, the machines are used to sort out the *exceptions* for the attention of management. This form of analysis is done on a monthly basis. It is not limited to the milestone records but is done on all records as the staff may demand.

Senior team members require various analysis products. Although many of these are prepared on special subjects by the office responsible for the subject, there are occasions when only an "across-the-board" look at the program will satisfy management's request. One example of the latter is the "*Monthly Program Analysis.*" This document is completed by the Friday preceding *Black Saturday.*

Its major purpose is to provide top team members with summaries of events from the previous Black Saturday—including status of action items and unresolved problem areas that may be a subject for discussion the next day. Each month, a special subject is analyzed in the last section of the document. The subject is either directed by top management or selected because of its general interest.

Since analysis is such an important tool of management—and since analysis documents take so many forms relative to frequency, scope, and purpose—it is well to emphasize that at the Air Force's ballistic missile management installation, the person best qualified to analyze a specific program, or any of its many parts, is the man responsible for the management of that program or part. For example, the ability of the Director of the ATLAS weapon system to manage his program is not principally measured by how well the ATLAS contractors perform, but in terms of his ability to identify problems that may affect their performance, and his ability to direct timely actions to solve the problem. *Thus, the Director gains nothing in attempting to present his program in the best light. To the central analysis staff—and we have several on the management team—is relegated the task of concentrating its efforts on analysis of interface problems between programs, overall management problems, and assistance to the various program directors and staffs in their analysis effort. This is an important principle in our form of team management.*

Major Benefits of MCS

Aside from the primary purposes of the *management control system,* there are three distinct "fringe benefits" which have been most valuable to our management team. In retrospect, these benefits probably were of more significance earlier in the program than was the primary mission of the MCS. These are:

Schedule Consciousness

It is normally-true that scientists and engineers engaged in research and development usually prefer to pursue their activities relatively free from the pressures of advancing the state of the art according to time schedules. *In the ballistic missiles program it was imperative to National Defense that Schedules be met.* No major strategic weapon system had ever met its original R&D schedules. This could not be tolerated in our program if this Country was to gain the needed time in the international missile race.

It is not easy to develop thousands of milestone schedules as our staff has done without becoming very acutely aware of schedules. It is not easy to review such detailed schedules month after month without being impressed with the importance of time to the program. *Time is the only resource on the program that we cannot get more of if needed . . . all we can do is get more out of the time we have available.*

Careful and Detailed Planning

Again, it is impossible to develop thousands of milestones and all of the many details in the *central reservoir of data* without first having done considerable planning. The ability to lay out a program in terms of minute actions to be taken dictates a planning and programming function of the highest order. In the words of General Schriever, "*The Management Control System forces management discipline*" . . . and it is only through discipline that a group of people, no matter how well qualified individually, becomes an effective organization.

Demands Coordination

If what we have said so far is really true, and the records in the central reservoir do in fact belong to the staff whose area is portrayed, then the Program Review Center staff should not make changes to the records unless told to do so by the responsible team members. They don't. Further, no records that involve more than one team should be changed without the concurrence of all affected team members. They aren't.

Coordination is important to any organization. In the team concept of management, it is imperative and is one of the three basic ingredients of the concept noted last month. But coordination cannot be left to chance . . . it must be well defined and formalized in the standard operating instructions of the organization.

Wrap-up

In light of Fayol's definition of management control (quoted last month), what have we learned about the *management control system?*

"Control is an examination of results."

The entire MCS is an attempt to provide standard techniques and tools for the team so that they can examine results and, thus, have *identification of the problem.*

"To control is to make sure that all operations, at all times, are carried out in accordance with the plan adopted."

When you think about it, the central reservoir of data records and publications—particularly the *Program Schedules and Data Books*—are the plan, in considerable detail. Are we carrying out the program in accordance with the plan, or are there many deviations and exceptions—the *diamonds* on the milestone records? The various responsible team members concentrate their efforts on the exceptions to the plan. Thus, their interest is that the program continues according to the plan, permit us to reach our objectives on schedule.

"Control compares, discusses, and criticizes."

The comparisons are rather obvious . . . weapon system to weapon system . . . contractor to contractor . . . major component schedules to complete missile need-dates, etc. It is only necessary to attend the *Program Review*

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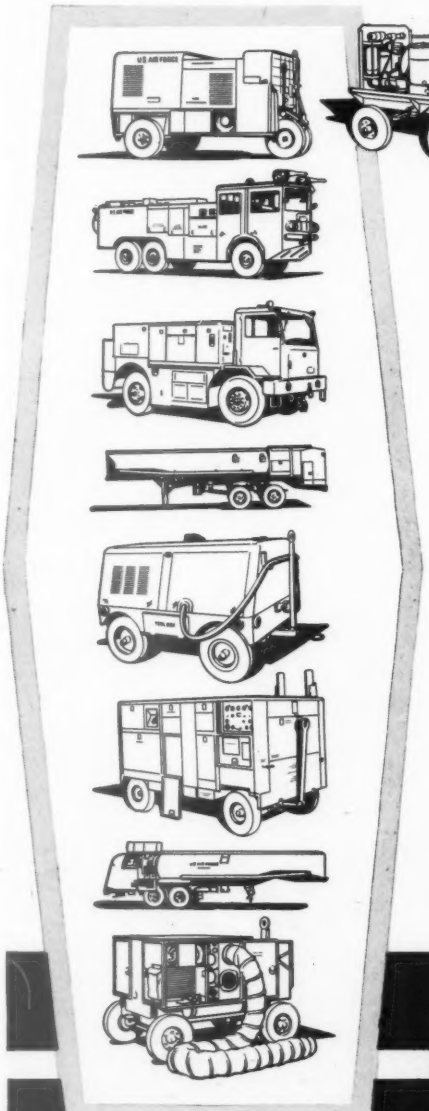

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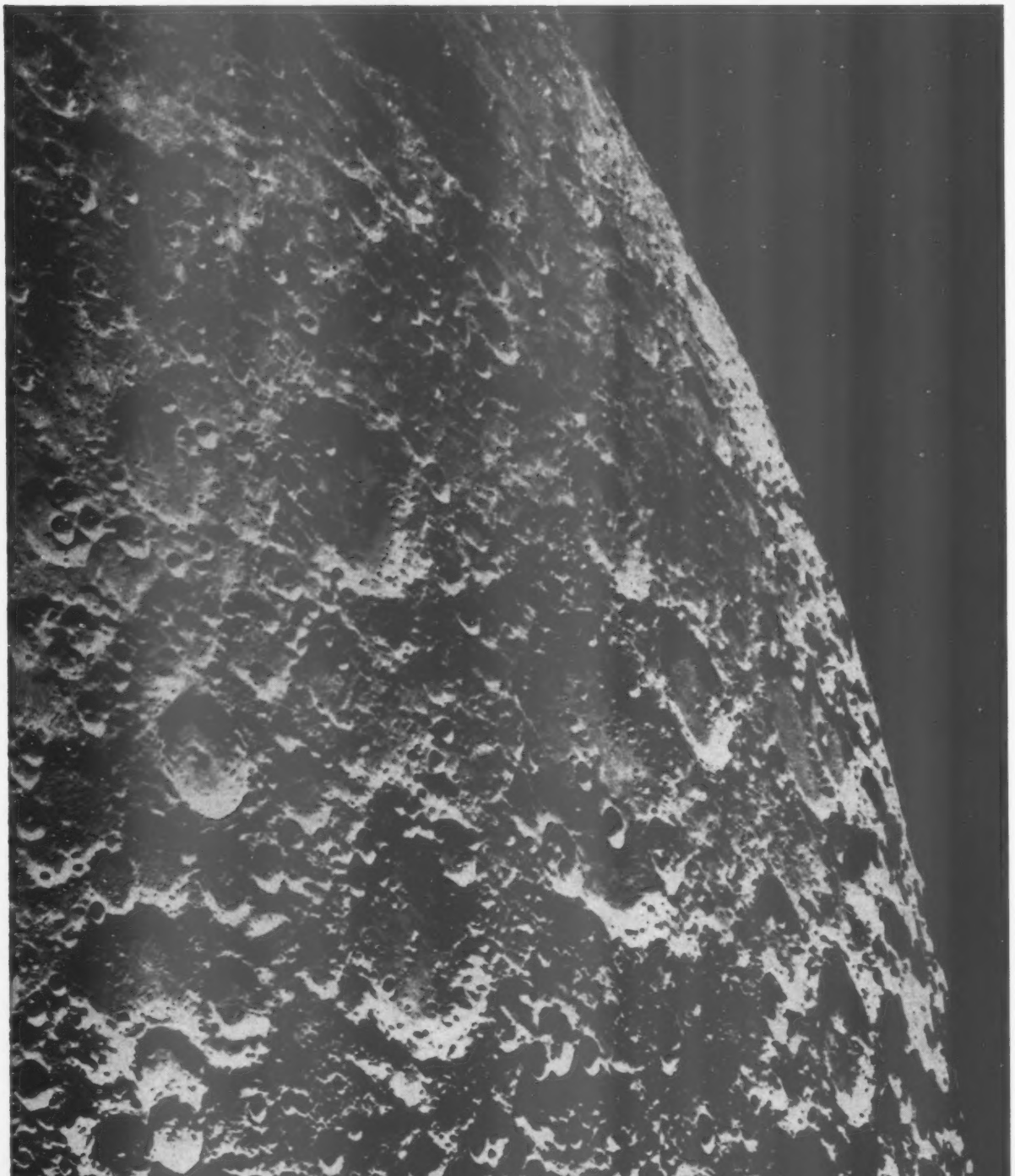

Meetings, particularly *Black Saturday,* to hear much discussion and—quite often—criticism. That is where criticism belongs . . . out on the table where the problem can be identified and resolved. Open, constructive criticism is a reflection of a healthy management organization. Unless there is a formal method for bringing out self criticism, it will exist under the table —smothered but active—gnawing at the foundation of the organization like termites.

"It tends to stimulate planning . . ."

This point was mentioned earlier in conjunction with the stimulus to planning resulting from the development of detailed records in the central reservoir of data.

"Simplify and strengthen organization."

This is one that may not be so obvious. General Schiever says, ". . . if a man knows where he is going, how he is going to get there, and where he is now, he can put it on a piece of paper" . . . the *Program Review Center* and its records are his *"piece of paper."* Those members of the team who cannot answer the questions are usually in trouble . . . their program is usually in trouble. These facts are obvious to top management through the MCS. This situation has occurred in the past, and changes were made which strengthened the organization.

". . . facilitates coordination."

Although the importance of coordination was also previously mentioned, it is well to re-emphasize this important element of team management. Because of its importance, all elements of the MCS are designed to provide thorough—but practical—coordination procedures. *Coordination provides continuity and completeness of effort.*

The *management control system* in use by the Air Force's ballistic missile management team is an effective tool, but the impression should not be given that it answers all management problems. The system can be improved, and improvements are introduced almost continuously. There are other tools of management control in use at the Inglewood complex, but the system herein described is the major management control activity.

The entire system is designed, as stated in the beginning, to provide top management with the assurance that there is a standardized and coordinated approach to planning and programming among members of the management team.

The more extensive a man's knowledge of what has been done, the greater will be his power of knowing what to do. —*Disraeli*

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Making the Industrial Team Work

By J. D. McLean
President, Hoffman Laboratories

THE TEAM concept of weapons system development/production is the most recent step forward by industry, in their attempt to give Defense Department the best possible product, using the full range of American industrial and scientific capability to accomplish the job.

Because it is a relatively new way of doing business, it is well worth taking a look at what it takes to make a team do its job well. Although team development work has been called "the logical outgrowth of the weapons system concept," the amount of out-growing involved defies comparison.

In the first place, let's define team contracting as we at Hoffman Electronics are using it—and then describe some of its significant elements.

Many descriptions of team contracting exist—and they are as widely divergent as they are numerous. Some people say that the concept is no different than the usual prime/subcontractor relationship, with the subcontractors defined as being members of the "team." Others see a team as a sort of organization or synthetic organization of companies banded "together" to get and complete a given program. And still others look on the team as a brand-new organization—profit or non-profit—to provide central management of a program.

Our definition—and the way we feel a team should be organized and operated contains something of each of these definitions but is, in essence, quite different from any of them. A literal definition? Team contracting is simply the combination of two or more organizations into a task force for the accomplishment of a specific program.

In our thinking, there are several elements that must be included if a team is to succeed. First, the team must be assembled well in advance of the Request For Proposal (RFP) and the members must be chosen by the team leader to provide outstanding specialty skills for the program. Secondly, the task or program must be broken down into its prime elements, and these sub-tasks must be assigned to the various team members for the preparation of the management and technical proposals, oral presentations, and price estimates.

In short, the team is selected—or if you will, designed—expressly for a specific program, and consists only of those organizations who are experts in the particular fields needed. We assume here that some advance knowledge of the customer's desires is available long before the usual 30-day bid preparation period, and that creative study and analysis of all the team members has been underway for some time.

Thirdly, it is important that one organization is the Boss. The leader organization provides undivided single-point responsibility for performance of the entire program, and must retain the requisite authority to maintain timely and effective performance from all team members.

Fourth, we strongly feel that within the framework of single-point authority—and the responsibility of the team leader for program performance—that there should be maintained a true development partnership between all team members, the leader and the customer. Much experience has shown us that effective team contracting relies heavily on high motivation for all members—to provide their most creative and enthusiastic thinking and participation throughout the entire program. We have found that this motivation can be maintained by continuing participation by all team members in program policy determinations, so that all have some influence on general operating policies.

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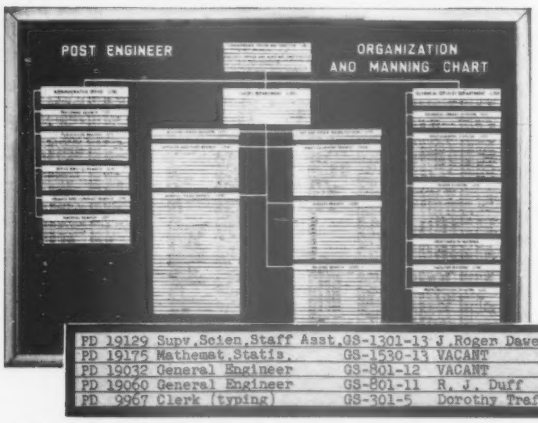

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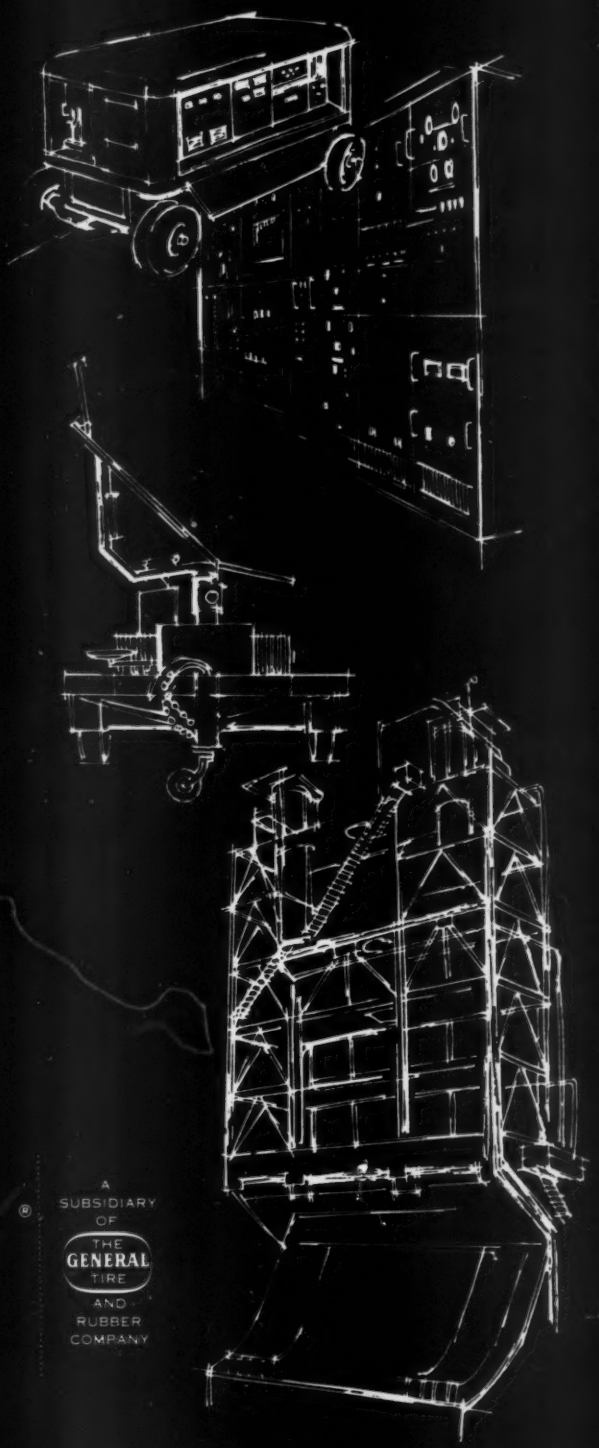

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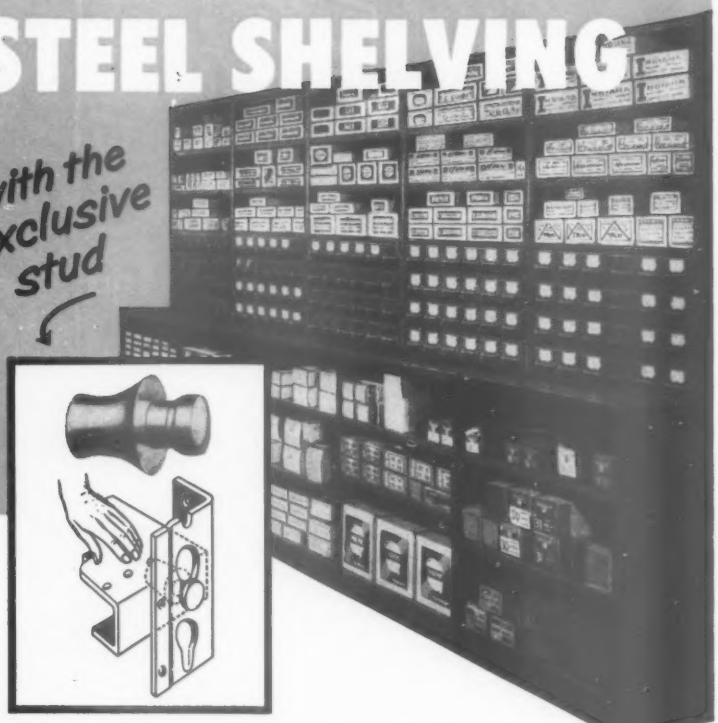

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Further, at all times, we make available to all team members the complete plans, schedules, task descriptions and progress measurements concerning all work on the program, so that they can relate their efforts within the context of the total program.

One of our project managers describes the role of the team leader as "always 300 yards out in front and running like the devil."

In terms of the mechanics of this role, the team leader is the prime contractor to the customer; is the program manager and planner; prosecutes the systems engineering and conceptual design; prepares or approves the equipment specifications; may develop some of the equipment; exercises technical and administrative surveillance over all equipment developments; tests and integrates the system as an entity, and provides for its operational capability, including all services and support in the field.

In terms of the dynamics of this role, the team leader must handle these responsibilities effectively while still maintaining top motivation among all team members, to provide the best overall results.

In some detail, the following are some of the operating techniques and attributes that we consider important:

(1) Forming the team early helps insure later effective prosecution. Individuals and organizations involved acquire considerable useful experience in working together before and throughout negotiation.

(2) The individuals who contribute to the proposal are generally those who perform the program. This maintains maximum knowledge, skill and motivation on the job—the men who defined the job cooperatively are the best qualified to perform, and are instantly ready to start work.

(3) The team has tremendous reserves of skills and manpower available to the program to meet any unexpected changes in requirements or for any emergency.

(4) Planning and control are improved since the work is defined in detail at an early date.

(5) Rapid response to change is assured, since a quick communications network is mandatory. Such a network is necessarily established to assure timely performance from all team members.

In an article of this length it is difficult to give a subject as complex as team contracting the full and detailed treatment it deserves. What I have done here is to touch the high points of this method—and to lay down some of the basic ground rules which I feel to be necessary for good performance in this type of work.

The Easy Way to ER Administration

Officers' Effectiveness reports - as they are presently handled - are creating an unnecessary burden on the men who must work with them. This article offers an obvious solution.

by Maj. Jay H. Williams

SUBMITTING effectiveness reports is part of an Air Force Officer's formal duty, no matter what his job or title. However, rendering these reports is never included in a job description, and generally is sandwiched in between other current activities. Most likely, the duty day is so full of routine work that reports due are taken home to complete at night or over a weekend.

We in the Air Force are working constantly to educate the military officer that quality of ratings must be the rule and not the exception. The vast references available on this subject show that we lack the perfect solution. But are we doing all we can to improve and produce quality with what we have now?

The present Effectiveness Report was developed after a careful study of recommendations received from operating personnel in the field, a review of military and industrial rating programs, and Air Force experience. It was designed to be short, direct and easy to administer.

Proving that Effectiveness Report quality under the present system is any less than it would be if scheduled another way would be impossible. But it would appear that an even flow of work would produce better quality than the out of proportion hump workloads that now exist.

Under the present system, the work of the Wing Personnel Section will be influenced first by annual Effectiveness Reports. Personnel data must be inserted on all reporting forms. Prior to final personnel data processing, Qualification Records will be checked on all officers in the grade affected to determine which officers must be reported on. The majority will not have been rated since the last annual report and will be due at this time. A letter of transmittal will route the report forms to the individual officer's squadron. The reporting officers will then be confronted with completing several reports in minimum time.

A bulk transmittal initiates the reports. However, they will be returned to Wing Personnel Sections individually or in small groups. Wing personnel workers examine the returned reports for accuracy and consolidate them when processing is completed. Administrative correctness, completeness and quality will be verified. Referral of reports and corrections on reports must be handled fast. The deadline at higher headquarters must be met.

Numbered air forces receive annual reports from all wings at about the same time. Some major commands permit the forwarding of reports direct from numbered air force to Headquarters, USAF. In these cases, the last close check on the reports for correctness, completeness and quality is concluded at the numbered air force. "Gigantic collection" cannot begin to describe the numbers of reports that arrive at Headquarters, USAF. Annual reports on practically all captains in the Air Force, for example, are a staggering amount when funneled into one recording place.

Here the 'snowball' state of affairs concludes until the next season for the particular officer grade under consideration. The rating officers again become unaware of Effectiveness Reports. The orientation these annual reports have furnished the endorsing officer will lapse. The personnel specialist will remain idle or devote time to other duties.

Physical examinations for all officers of one rank, if scheduled simultaneously, would totter the medical department. Again, suppose all officers of one rank took instrument flying examinations at the same time. This has not happened because officers are scheduled for physical and instrument flying examinations on their birthdays.

A number of States have encountered similar hump workloads in issuing vehicle and driver licenses which expired at a stated time. The workload was even more imposing than is presently faced in the Air Force with annual Effectiveness Reports. The remedy used by many States is a staggered system, using the driver's birthday as his license renewal date.

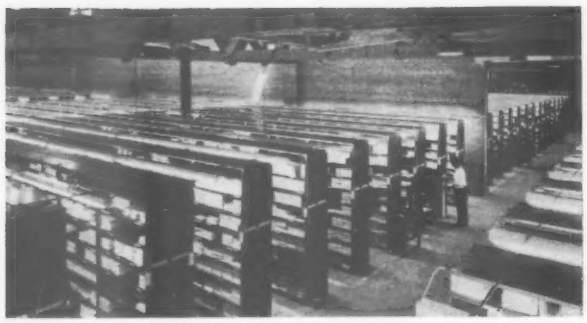
Following this system of annual rating according to birthday will balance the present hump workload. A constant flow of annual reports will insure that reporting officers become Effectiveness Report minded.

However, the end to one problem will aggravate at least one other. Air Force Regulation 36-0 specifies that each officer will be rated against other officers of the same grade. USAF has historically been troubled by the rating officer's tendency to rate by grade —rating a major in comparison with a lieutenant. The recommendation to rate annually according to birthday would certainly intensify this. Instead of receiving reports for one grade at one time, rating officers might receive reports on several.

Evaluation periods to correspond with the rated officer's birthday are feasible. The necessary resources are within Air Force capabilities today. The new system would actually result in better use of personnel man-hours and materiel resources. The recommendation would keep commanders and supervisors Effectiveness Report conscious. Annuals will become a part of routine work instead of being seasonal, as they are now. Rating and endorsing officers would have to handle Effectiveness Reports as a part of their regular duties, with the reports always before them for rating, endorsing or review. Annual reports would be due over a twelve month period instead of the present six months.

There is a strong possibility that existing Effectiveness Report deficiencies are robbing the combat efficiency of the active duty military establishments. A revamp of the Effectiveness Report system, to keep commanders and supervisors Effectiveness Report conscious—while easing the load on personnel officers—will be a definite contribution to better national defense.

How Steel Shelving Solved a Storage Headache



THE U.S. Army Adjutant General Publications Center in Alexandria, Va., receives and distributes an average of 500 tons of printed material each month, covering a range of 40,000 different publications and forms. Most of the material consists of Army regulations, technical manuals (example: How to Repair a Truck) and Supply Manuals, which list equipment sources, prices and similar information.

Material comes in by truck and rail, is moved from electric forklift trucks to the bulk and storage area, re-distributed on hand trucks to shelves.

When a requisition for specific material is received, as many as ten persons may be required to fill the order. Requisitions vary in size from a single manual to carload lots.

In the case of very large orders, stock pickers remove the publications from the shelves, mark them and place them on a conveyor belt which carries them to the shipping section. After being packed in cardboard containers, the assembled order is moved via pallet and lift truck into the waiting carrier.

And in this pipeline the biggest headache was shelf storage. Shelving consisted of wooden runners nailed to vertical, wooden supports. To alter shelf and divider spacing to match changing storage requirements, it was necessary to pry the boards loose and renail them in the new location.

Dirt and paper dust, which are always associated with printed material, settled into the rough wooden surfaces where they were difficult to wipe away, added greatly to the ever-present fire hazard.

Frequent shifting of shelf loads caused nails to work loose, making the wooden shelves weak and wobbly. The thickness of the shelves and supporting members made it hard to locate, insert and remove materials.

To improve operating efficiency, key personnel at the Publication Center launched a modernization program that was completed recently. Wooden selving was replaced with boltless steel shelving.

To provide dust protection, and compartmentalized storage, closed type units were chosen, having panels on the tops, backs and ends of the shelves. Almost four miles of the boltless steel shelving, known as Penco T-line, was installed throughout the 35,000 sq. ft. storage area of the center.

The installation was completed while the Publications Center maintained its regular schedule of operations—receiving, filling requisitions and shipping. With 40,000 different publications and forms involved—a number increasing regularly—it was obviously impossible to suspend operations in any sector, or to move more than a minimal amount of material from its designated spot at a time.

Since no special tools were needed to assemble the shelving, the changeover was accomplished in minimum time. The rate of subsequent assembly was determined by the Center men available, which in turn depended upon the numbers of requisitions received and awaiting processing. When available men could be detailed to the task, the printed material was removed from the wooden shelf area and placed on rolling tables, suitably tagged and numbered. The Penco unit was installed, and the material placed in its new location.

In practice, the conversion proceeded intermittently, and the original crew of ten men was soon reduced to three. Even so, as many as 85 shelving units were installed in a single day. The new shelving provides over 100,000 sq. ft. of usable storage space, which is 15 percent more than the wooden shelves provided in the same floor space. Thinner dimensions of shelves and dividers simplify location, removal and placement of materials in the new shelving.

Most of the shelves are spaced ten inches apart, center to center. In general, shelf spacing will remain unchanged, for the present. However, dividers will be moved constantly to adjust for, and keep separate, various sizes and types of publications. The dividers can be unfastened, moved and refastened without tools in a matter of seconds.

The enameled surfaces of the shelves are smoother than the former wooden surfaces, and permit paper materials to slide in and out of the new shelves easily. The smoother shelves are also much easier to keep clean. The closed type shelving units provide a good degree of dust protection. All publications are numbered and labeled for quick, positive identification, with label holders fastened to front edges of shelves.

Having no nails, screws or bolts to work loose as shelf loads are shifted, the steel shelving units remain rigid and strong. Elimination of wooden splinters and protruding nails, has allowed stock pickers to work more rapidly and safely.

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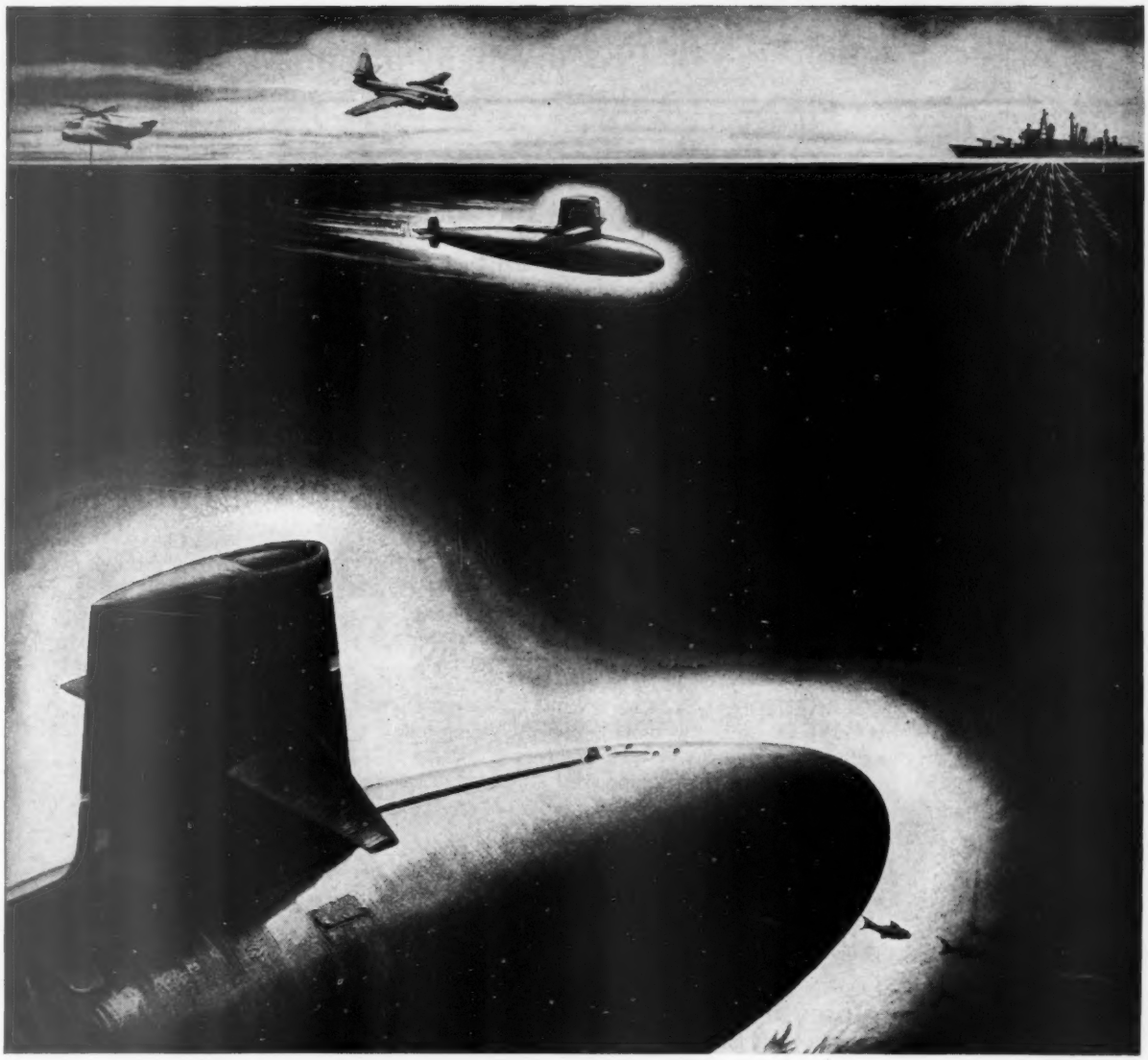

Sixth sense for the hunter-killers

"Our greatest need is for longer range detection equipment and the weapons to give us the kill capability by the time we have the extended range search and identification gear."—Rear Admiral John Thach, Commander Anti-Submarine Defense Group ALFA.

The Navy's Special Task Group Alfa—the Hunter-Killers who defend against enemy submarines—must find faster and deadlier means of detecting and destroying enemy submarines in time of war. Submarines launching nuclear warheads could destroy major cities and military installations in a matter of minutes.

ARMA has accepted the challenge to provide for the Navy's greatest ASW need, insuring our future by swifter and surer elimination of the undersea threat.

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Procurement Trends

A FOUR YEAR STUDY ON AIR MOBILITY for engineering equipment has been completed by the Army, came up with training techniques permitting untrained personnel to dis-assemble and load a D-7 tractor on an aircraft in 55 minutes after only one dry run. In the same situation, it used to take personnel from two to four days to do the same job. (For details, see news item, p 43.)

RAPID PROGRESS ON NAVY REORGANIZATION should begin soonest, with the appointment of the men who will be running the new Bureau of Naval Weapons. Aviator RAdm. Paul D. Stroop will head the new organization, moving up a step from former Bureau of Ordnance Chief's duties. "Interim" operation of former bureaus under the new name is likely, at least until the first of the year.

EASE OF MAINTENANCE WILL BE BUILT INTO MINUTEMAN through its fully transportable configuration as presently planned. The missile will be able to be lifted in and out of launching sites with comparative ease and no disassembly, and can be transported as a unit from plants to operational launchers.

OPERATIONAL ATLAS MISSILE SHOULD BE FIRED SOMETIME THIS MONTH, according to present plans. Coming about a month behind the original schedule, the firing will take place at Vandenberg AFB, Calif. Reason for the speculation about this is successful August tests of the missile at Cape Canaveral.

A VIGOROUS CAMPAIGN BY TACTICAL AIR COMMAND for more money, planes and support seems most likely to get started soon. New TAC Commander Gen. Frank Everest comes to the post fresh from Europe, will bolster his arguments with first hand experience of what is needed by field commanders and members of NATO.

MORE DEFENSE DOLLARS ARE DESIRED, for a change, by large old line companies instead of small businesses. Leading the drive are General Motors and E. I. du Pont. Aim is not so much for the profits involved, but more for the prestige and diversification that the defense business offers.

POLARIS-PACKING CRUISERS, some Navy men feel, would be logical complements to the under-water originals. Backers of the idea feel that surface-borne Polaris missiles would be easier and less complicated to handle, thus balancing out the difficult-to-detect characteristics of the submarine. Best bet on outcome: too much money needed elsewhere would be involved, little chance of success.

HUGHES-DEVELOPED TACTICAL AIR DEFENSE SYSTEM promises nearly instant hostile aircraft destruction, through coordinating antiaircraft missile firing at split second speeds. Combining speed, mobility and reliability, the "vest pocket" system offers many advantages to U.S. and allied ground forces, will probably be used by NATO troops, as well as U.S. forces in Europe.

POTENTIAL SORE POINT IN RESEARCH-PRODUCTION TRANSITIONS hinges around the non-service nature of Advanced Research Projects Agency. Question: if ARPA develops a new and better satellite system with Navy and Air Force applications, who gets it? Disputes will probably be more smoke than fire, offering easy settlements and much publicity.

Regardless of size (and equipment) military units move best by rail. Train travel is comfortable, convenient and efficient. Troops, their baggage and impedimenta move together and arrive together at destination. Only the railroads are capable of providing complete transportation for any movement...anytime...any size...in any weather.

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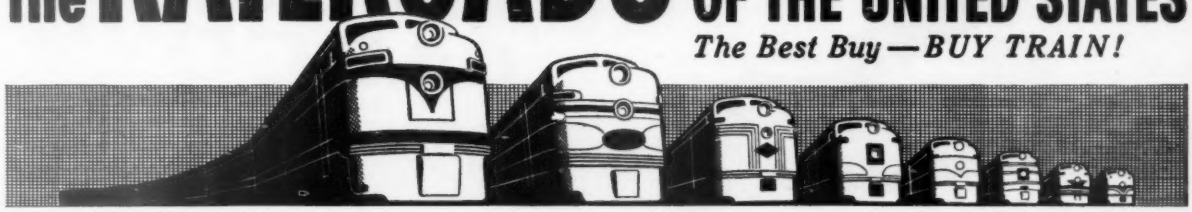

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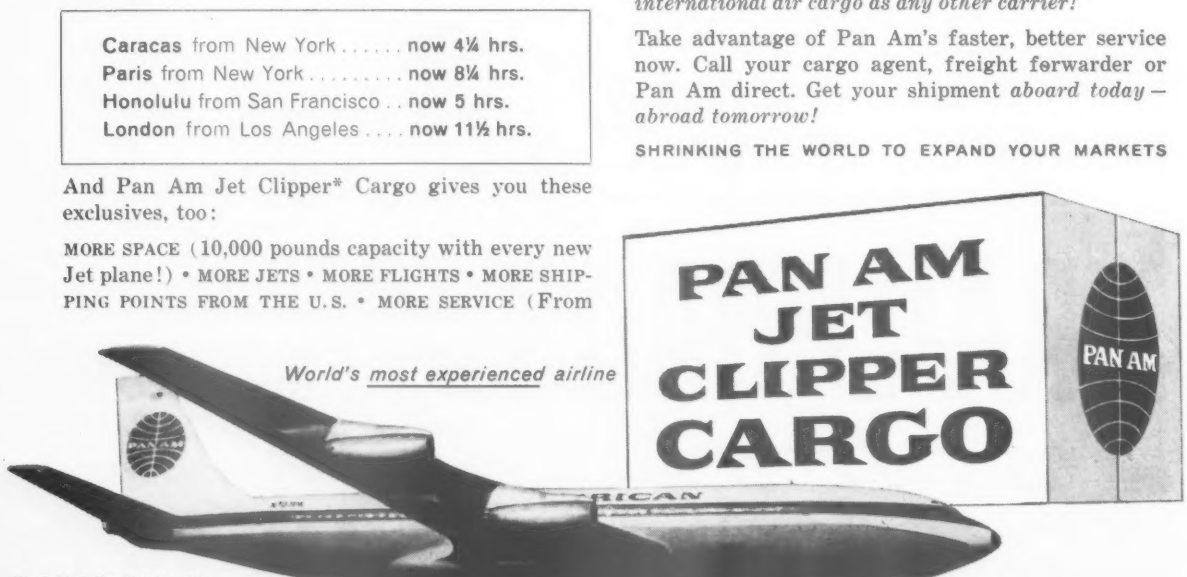

*Trade Mark, Reg. U.S. Pat. Off.

Engineers Give Details On Air Mobility Study

Army engineers last month announced completion of a four year engineering study on air mobility of engineering equipment—particularly heavy construction items. Study culminated in a five month test at McGuire Air Force Base.

Low cost ($300,000) contract study was handled by Alfred E. Blomquist & Associates, a transportation engineering firm. Goals of the study were (1) To provide a planning information officer manual for field officers on what cargo planes can do; (2) Develop training manuals which would provide disassembly, load, tie-down, unloading, and re-assembling information for military field personnel untrained in such operations.

Planning information manual and aircraft cargo capacity information has already been published. Approximately 19 manuals on how to handle different items of heavy engineering equipment will be in full use sometime next spring. Study provides a major step in ground force preparation for use of airlift, is the first time any Army agency has conducted such a study on a scientific basis.

Some of the results have been startling. Among them:

1—In every case, untrained troops, after one dry run, were able to air cargo process heavy engineering equipment—even though they had never done the work before.

2—Although all the engineering equipment analyzed had heretofore been classed as not air transportable, engineers discovered that of 147 pieces of equipment studied, only 19 would need modification to fit in existing aircraft.

3—A side comment on the current Pentagon airlift capability controversy: Military would need nearly double its present inventory of cargo aircraft to handle military airlift requirements in the event of war. In addition, on engineering equipment alone, if Laos should flare up and the U.S. jump in, we would be unable to support an action there if a similar brush fire started at the same time in the Middle East.

4—Airlift of ground forces is still not being used as it should, partly because the Army has not been requesting it enough and partly because the Air Force has not worked hard enough to develop a cargo airlift capability—particularly in short hop, intra-theatre operations.

One question raised: Which service is going to move first? In private speculation, officials concerned with the project said it is possible that former Army Chief of Staff Maxwell Taylor might have had less trouble calling for more Army airlift if he had had the same sort of study for the entire Army that has just been completed for the engineers alone.

The study's biggest contribution: Washing out the opinionated answer of the command pilot and cargo master, replacing it with engineering-proved information on just what equipment in the engineers can be shipped by air and just how much air cargo aircraft can handle.

Emergency Procurement Set by New Directive

A new system of planning—covering all types of wartime emergency procurement—has been set up by Assistant Secretary of Defense for Supply and Logistics Perkins McGuire.

The new directive will change production allocation planning as it has been practiced since World War II by the services. Initially stated by the Air Force, the premise on which the new directive is based states that there will be no time to plan for mobilization in the event of general war. However, the new directive allows for emergency procurement, when it is needed.

The armed service procurement officer monitoring a given plant is—under the new directive, 4005.15—responsible for planning all systems capable of being made in the plant. Present planning agreements will remain effective until cancelled or otherwise terminated.

Electronics Agency Gets New Charter

New authority for the Electronics Production Resources Agency will result from a recently re-drawn charter—DOD Directive 5154.15, issued by Defense Secretary Neil McElroy.

Under the new measure, EPRA will be responsible for: (1) obtaining from the military departments data-reflecting electronic end items, components and material requirements, schedules and deliveries; (2) acting as coordinating agency to get data for single-service procurement of electronic items; (3) reviewing industrial capabilities for production of electronic equipment for defense-supporting requirements; (4) identification of potential production bottlenecks and recommendation of

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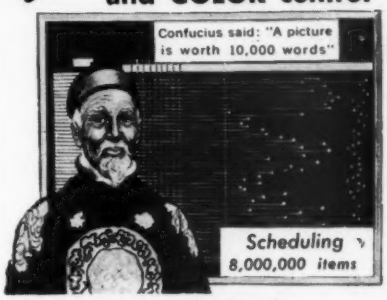

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LeTourneau-Westinghouse Tournapull® scrapers provide the extra versatility you'll need to carry out new, perhaps yet-to-be conceived strategies of the future. And right now, they'll handle your every-day dirt-moving fast, and at lowest cost.

Go-anywhere mobility . . . moves fast

Self-propelled rubber-tired Tournapulls travel up to 30 mph — on roads, over bridges, thru tunnels, in traffic. They move cross-country just as fast and easily . . . wade streams, climb hills, go almost anywhere. These units maneuver easily, U-turn in tight quarters . . . make 180° turns in 10 to 14% less than unit length.

Construction or combat task . . . 'Pull* handles it fast!

Easy-loading, electric-control Tournapulls (9, 18, or 28-yd heaped capacities) move dirt on steady, high-production schedules. Big, low-pressure tires give ground-gripping traction . . . apply maximum pull-power for fast loading, hauling, spreading. *Exclusive* power-transfer differential keeps units working thru mud, sand, snow, soft fills, etc. . . . thru footing that would bog down other haulers.

Easy to train operators

Service or civilian personnel — at home or abroad — quickly learn how to get big-yardage output with Tournapulls. Controls are convenient, require little physical effort. Steering and scraper operations are powered *electrically* . . . apron, bowl, and tailgate are actuated by fingertip movement of toggle switches. Units are easy to lubricate, simple to maintain. Emergency supply of parts available thru world-wide distributor organization.

Controls unaffected by climate

Because Tournapulls are operated by lighting-fast electricity, they give same, quick response in extremes of heat or cold . . . are unaffected by dust, moisture, or unusual climatic conditions. There's no problem, as with other power-control systems, of pressure leakage, variable functioning with change in temperature, or accelerated wear through contact of moving parts. No noticeable loss of pull-power when controls operate.

Interchangeable, trailing work-units

In just a few hours, Tournapull prime-mover can be unhooked, and interchanged to operate any of 4 other efficient trail units . . . Rear-Dump, bottom-dump, lift-and-carry crane, or flatbed hauler.

Tournapulls give you big work-output for today . . . great flexibility for potentials of the future. Call or write us for complete information.

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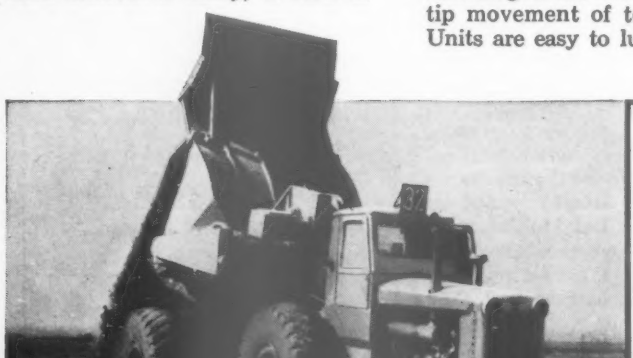

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Here's equipment for fast, off-road hauling of dirt, rock, and other shovel or conveyor-loaded materials. Tournapull Rear-Dumps (11, 22, 35-ton capacities) position faster, maneuver easier, dump quicker, make more round-trips daily than ordinary truck-type haulers. They are simpler in design, give fewer maintenance "headaches." Units employ same prime-movers and control system as Tournapull scrapers . . . give you similar high performance and strategic advantages.

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remedial action, and (5) solving any critical shortages and acting as a clearing house for requests by contractors for assistance under the defense Production Act.

Production Plans Set For B-52 and B-58

B-52 bomber production will continue at about its present rate until about Fiscal 1961 when product improvements will cause a "temporary dip," according to AF Secretary James Douglas.

Following the changes, production rates should return to their previous level. First versions of the B-52H will be bought in fiscal 1960, and a more advanced version of the big bomber is reportedly in the works.

Douglas has also said that production rates on the B-58 will increase until late 1960, and then level off at the increased rate.

Air Mobility, Planes Stressed at AUSA Meet

The foot soldier's air mobility is the keystone for much current Army planning, according to the tenor of this year's Association of the U.S. Army convention in Washington. In this line, Army aviation backers are hoping that 239 aircraft will be set as a minimum in both this year's and next year's budgets for Army aviation.

Troops travelling individually or in small groups would appear to fit well with the Army's future tactics. These troops would carry only about 24 lbs. of equipment, exclusive of their rifles.

Helicopters—such as the YHO-2HU Hughes two-place model—and Skycars like the Piasecki VZ-8P model would figure heavily in such planning.

Defense Procurement Is Set for Review

There will be major changes in the fiscal 1960 procurement programs of the three services as a result of the annual review now underway preparatory to the apportionment of funds just voted by Congress to run DOD.

Aim is to hold cash payments for Defense Department bills to $41-billion although signs point to an increase of 1-2% above that level. The only effective method to make sure payments do not exceed the predetermined level is by controlling contracts placed with industry.

Reprogramming has other virtues, according to Pentagon thinking. It provides a new look at plans made more than eight months ago and machinery for changes either recommended or authorized by Congress.

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Research Rundown

BRIGHT NEW HORIZON FOR CDEC—Army's Combat Development Experimentation Center—appears to be in the immediate offing. Other Army elements are beginning to see the high value of CDEC. Among the examples: exchange of information with Army weapons boards has stepped up appreciably in the last few months; tech service combat arms now have full representation (28 persons) as observers at Ft. Ord, Calif., as do the Canadian and British Armies.

FIRST MESSAGE FROM THE MOON will come courtesy of the Navy, probably early this month. Transmission will be sent from Hawaii to U.S., reflected off the only earth satellite that was orbited before the Sputniks. Navy is hoping to be able to transmit photographs over the same circuit. Experiment will be conducted by Office of Naval Communications.

WHAT COMES AFTER THE MINUTEMAN is one of the leading questions being considered by the Air Force at this writing. Third generation intercontinental missiles will probably be lighter and smaller, more sensitive to control (perhaps being able to take evasive action), far more accurate and with larger warheads to make base-hardening futile.

A SENSIBLE MOVE TO THE METRIC SYSTEM of measurement was taken by Army's Infantry school, as of July 1, this year. To be used in instruction work and manuals, the new system will—among other things—make the training consistent with the standard map system.

SATELLITE DETECTION FOR ASW WORK is one new area currently being probed by the Navy in their search for an answer to a very large problem. Details on the program are highly classified. (For further information on ASW work in industry, see page 14, this issue.)

ATOMIC TESTING—IF GENEVA TALKS DON'T SPEED UP—MAY RESUME this fall, with October 1 as most likely date. Small yield weapons for tactical use and lighter, more powerful warheads for Polaris and Minuteman would receive emphasis if testing were to be renewed.

ROCKET BELTS FOR ARMY'S FIELD SOLDIERS will probably be developed along two parallel lines. Simpler of the two versions would be strapped around the wearer's waist, would be used for short hops over obstacles. A more elaborate harness and more powerful rockets would be used in the other model for longer leaps.

GREAT LIMITED WAR POTENTIAL IS SEEN FOR DAVY CROCKETT, a small missile to be fired from a tube similar to that to be used with Red-Eye. With the possibility of sub-kiloton atomic warheads for the small missiles, Davy Crockett seems to be a promising system. The highly classified weapon is being developed at Army's own Rock Island Arsenal.

WORK ON SENTRY RECONNAISSANCE SATELLITE is progressing well —may even be a bit ahead of schedule. Related work with the Discoverer series of Advanced Research Project Agency satellites has shown capability to stabilize satellites in orbit, as will be necessary with the reconnaissance model.

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AUSA Meeting Shows Future Hardware

Displays of new hardware for tomorrow's Army highlighted this year's Association of the U.S. Army convention in Washington.

Combat Radar

Advanced equipment shown included: AN/TPS-25 (for Army Navy/Transportable Radar Surveillance-model 25), Army's newest combat surveillance radar. Built by Hazeltine Corp. of New York, the Tipsy 25 can spot a rolling tank, truck or jeep ten miles away, pick up a crawling soldier at two miles.

Radar transmits pulses and receives reflected pulse energy from moving targets as well as the surrounding stationary terrain. Energy received from a moving target is shifted in frequency due to the same doppler effect you notice in listening to the whistle of a passing train.

An experienced operator can distinguish the sound made by a walking soldier (a sort of ump-ump-ump-ump), the two-toned whistle of a tank, can even distinguish a man from a woman. To double check what he hears, the operator can watch the set's oscilloscope for a visual target presentation, plot target movement on a terrain map mounted above the display board.

Tentatively scheduled for division-level use, Tipsy 25 costs $47,000 a copy. Army already has 12 sets, 37 more in production, has given Hazeltine a contract for 40 more.

Buck Rogers

Running one-two with the Tipsy 25 as best drawing card at the convention was the 1965-era Soldier of the Future, a presentation dreamed up by the Army's Combat Development Experimentation Center at Fort Ord, Calif.

Much of the equipment which adorned this Buck Rogers-like fighter is gear already being used by CDEC troops in their experiments—to develop tactics, techniques, organizations and associated equipment requirements for the Army of the Future.

Gear on display included: a transistorized helmet radio receiver; infra-red binoculars; an image metascope to protect against enemy infra-red detecting devices; face and hand coverings to guard against thermal effects; explosive foxhole diggers; lightweight "welded" combat boots to protect from radio active dust and water seepage; an M-14 rifle; a "jump belt" to allow tomorrow's soldier to propel himself through the combat area after he embarks from a zero ground pressure flying platform or flying car.

Lacrosse Details Unfold

Under wraps until last month's meeting, the reason Lacrosse missile can pinpoint nuclear and conventional warheads was also presented. Reason for Lacrosse capability as close support weapon: a mobile ground guidance station normally located in front line area.

Guidance equipment includes an angular tracker, a computer, range and direction indicator, target locating device (in exact distance and elevations), and power supply. Initial missile firing is handled by conventional artillery fire direction methods.

From here, Lacrosse is picked up by forward tracker whose computer "fixes" the missile on its target, enables knocking out fortified positions with one round "under all conditions of weather or visibility."

Battlefield Communications

International Telephone and Telegraph Corp. displayed an all-digital communication and switching system which automatically by-passes battle-damaged lines and re-routes messages over the fastest available path.

Called DIGICOM (Digital Communication System), the switching facility handles information from computers, radar, analog signals, teleprinters, tape-readers, voice and telemetering sytsems, was designed in cooperation with the Army Signal Research and Development lab.

Each DIGICOM unit is completely transistorized, operates on less than 30 watts of power. System was conceived to complement military strategy calling for Pentomic Army divisions to fight widely dispersed battles in which speed, maneuverability, and most important, reliable communications will be decisive factors.

Electronic "Brain" For Polaris Subs

A transistorized electronic torpedo control system will be installed on the Polaris-firing submarine *George Washington*. Navy has said that the Mark 112 Torpedo Fire Control System—basically a computer—will be built by the Sperry Gyroscope Co.

The Mark 112 system will be used with attack, hunter-killer, and missile-launching subs, and can be operated by one man in an emergency. Offering instantaneous action, low power consumption and reduced size, the new system weighs only about half as much as former control systems.

Mark 112 can be used in conjunction with sonar, radar and other sensing devices, and will operate effectively with acoustical torpedoes, guiding them far enough away from the mother ship so that no danger exists.

Minneapolis-Honeywell Space Capsule Built

Delivery is set for this month on Minneapolis-Honeywell's simulated space capsule, to be used by the Department of Astroecology at the Air Force School of Aviation Medicine. The simulator will test the psychological and physiological stresses man must face during space flights.

Designed for occupancy by two space-men for 30 days, the seven-ton device is eight by 12 feet in size. Air Force has revealed that careful screening has set up the group of AF pilots from which the first two "astronauts" will be drawn.

Once it is sealed for tests, the capsule will be completely isolated from anything that might indicate the capsule was anywhere but in space. Closed circuit television will allow observers to study the subjects, and ports in the capsule are one-way glass, opaque from the inside.

First N-156F Flight Goes Successfully

Norair Division of the Northrop Corporation has announced the first successful flight of the N-156F Freedom Fighter, at Edwards AFB, Calif. Designed specifically for use by allied nations, the plane will have the performance of Century-series jets, at about two-thirds of the cost.

The Mach 2 fighter broke the sound barrier 40 minutes after it had taken off for the flight. Transition was so smooth, the test pilot said, that it was only noticable on the plane's instruments.

Simplicity of design in the aircraft will enable foreign nations to manufacture it easily under licensing agreements, to repair it without a large requirement for highly skilled personnel, and maintain and operate the plane without needing highly complex ground support equipment.

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Newsletter

Armed Forces Management Association
Washington 25, D.C. Phone: OTis 4-7193

National President: Hon. George H. Roderick Executive Director: VAdm. Harry E. Sears, USN, ret.

New National Officers for FY '60

The new Board of Directors of AFMA, as listed in the June issue of the *Newsletter*, have announced the election of national officers for the coming year. Meeting on the Seventh Anniversary of the Association, August 13, with AFMA's first president James M. Mitchell as honored guest, the board selected a group whose stature and dedication augur well for a continuation of the fine progress made by our organization in the past year.

Elected as president was the Honorable George H. Roderick, Assistant Secretary of the Army for Financial Management. Lieut. General Roscoe C. Wilson, Deputy Chief of Staff for Development, Department of the Air Force, was elected Executive Vice President. Vice presidents elected included: Howard Hyde, Office of the Secretary of Defense; Brig. General Chester R. Allen, USMC; Colonel James L. Tarr, USAF; Eldon Sweezy, Department of the Army; and Colonel William C. Howell, USA. John F. Snyder, Office of the Secretary of Defense, and Irving M. Greenberg, Department of the Army, were elected Treasurer and Secretary, respectively. Vice Admiral Harry E. Sears, USN Ret., the Association's full time Executive Director for the past year, will continue in office.

In his message of acceptance, Secretary Roderick took note of AFMA objectives, which he stated, ". . . are worthy of our conscientious and active support," and the valuable service which the Association is rendering to the nation. He noted with pleasure the growth of the organization and the progress that has been made in the Association's management improvement program.

Plans for the Year

Included in the Board of Directors' action, was a review of AFMA program and progress for the fiscal year recently ended, and plans for the current year. It was noted that under the able leadership of Rawlings S. Poole, recent past president, a comprehensive program of services to Defense and the membership was initiated, and is being implemented to the extent the Association's organization and facilities will permit. With Association growth, existing program areas will be more fully developed at the same time new areas are being explored.

Program Highlights FY '60

In order that chapters may conduct their programs more successfully, and the membership at large may be informed of what their association is planning for their benefit in the year ahead, highlights of the year's program follow. To arrive at the program, the purpose of AFMA—to assist in the improvement of defense management, while providing services of value to the individual and corporate membership—was kept firmly in the forefront. As a result, the fine program developed by the Programs Directorate last year, and outlined in the August issue of the *Newsletter* under "Review of Progress," will again be followed. Once again, more emphasis will be placed on those areas of the program considered most timely and susceptible of pursuit with available facilities. In this connection, the National Headquarters will always welcome comments and suggestions whereby our program can be strengthened and improved, that our purpose and goals may more nearly be realized. The success of our worthy endeavors depends on the wholehearted support and co-operation of *all* the membership. This is *your* association, designed to help *you* while providing a valuable service to our country. Specific ways in which you can assist the program follow:

Spread the word about AFMA to your friends and associates at your place of work and in the community. Membership in the Association is open to any reputable individual—on a Regular or Associate Member basis—who believes in the objectives of AFMA. Interest companies in joining under Corporate Membership provisions; we need their management knowhow, and believe the Association has much to offer them in the way of management knowledge, and association with management minded Defense personnel.

Where twelve or more members are located in the same general area, consider the possibility of forming a local AFMA chapter. Your Headquarters will assist you in every way possible to get your chapter organized and underway with a minimum of difficulty for a most effective and rewarding operation. The scope and comprehensiveness of chapter programs necessarily must vary considerably to meet local conditions. Again the operation should be held within the limits of local capabilities. Enlist the support of your local installation commander in this worthwhile endeavor. Your National Headquarters will assist you in this effort at your request.

Chapters can render valuable service to the Association by submitting management ideas and suggestions for dissemination by National Headquarters. Likewise, lessons learned in chapter operation—programming, the best time for meetings, public relations and publicity, the awards program and chapter administration—all these would be most welcome for dissemination to existing and newly-forming chapters. Particularly desired are sample chapter programs for the year. The experience gained in past years by the older and well-established chapters would be of great assistance to the more recently organized AFMA groups in the field.

Administrative Notes

Individual questionnaires are still being submitted on new members by a few chapters. These are no longer required, having been superseded by AFMA Form 2 (Revised). Chapter secretaries submit requests for new Form 2's to National.

Insure that applications for membership are filled out completely. AFM magazine must have full data including complete business address before magazine subscription can be entered. Important.

Inform your chapter secretary or National if you fail to receive magazine. This is one of our most important mediums for the exchange of management knowledge.

For the economy minded: take advantage of the new 2 and 3 year membership at reduced rates. Helps our administration, too!

(For further information on individual or corporate membership in the Association, circle number 200 on the business reply card on p. 49).

(continued from page 6)

BIZMAC or their newer 501. I believe either will qualify as a "major computer system." The inclusion of these RCA systems would have made your comparison more complete.

Col. Frank G. White
Deputy President
U.S. Army Maintenance Board
Fort Knox, Ky.

Nose-deep in detailed collating of data, we let common sense take a vacation, inadvertently left General Motors out of the auto-making business. Breakdown on Radio Corporation of America's 501:
Numerical System: bin coded dec, al
Input: PC-Pat-K-MT
Memory: MC-MD-MT-Disc
Output: PC-Pat-Pr-MT
Power Requirements: 35 KVA
Sq. Ft. Area Rqmnt: 1200
Cost in $1,000: 600-1250
Rental Per Mo.: $12,000-25,000
Production Record: P-4, O-2

The largest known EDP system in operation (at Army Ordnance Tank-Automotive Command), BIZMAC has been replaced by the 501 as RCA's entry in the electronic data processing field. Thirty of the all-transistorized 501's have been sold to date. Although its price is in the medium-sized computer range, it is actually classed as a large size computer—on the basis of work capability.

First customer to receive a 501 system was the Navy Bureau of Ordnance in June, six months after RCA announced product of what it calls "the first business oriented, all-transistor EDP system"—Ed.

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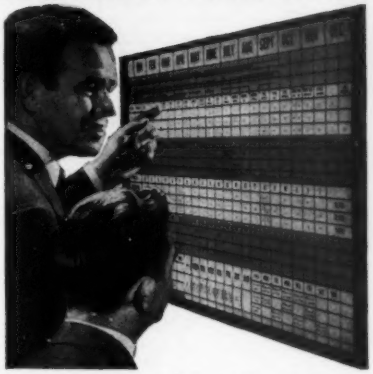

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Your Investment Future

PARLEZ-VOUS WALL STREET?

"Do I have to learn another language?"

Many new investors have been known to react this way when they first come in contact with the jargon used in the world of finance. And it must be admitted that to the uninitiated the language of Wall Street can be as baffling as Swahili.

But you don't have to take a Berlitz course to understand your broker. The proof is contained in a handy little booklet called "The Language of Investing," recently published by the New York Stock Exchange. Even a nodding acquaintance with it will effectively bridge the linguistic gap between the novice investor and the professional. What's more, it will help the average service family to get more out of the financial pages of their newspaper.

The booklet explains 240 terms in common use along Wall Street. Many are capsule descriptions of transactions that would take pages to explain in detail. Some, like the name Wall Street itself, date back 300 years. Almost all are colorful and original—but precise.

Here's a fair sample of an everyday occurrence described in financial lingo:

Mr. Midland was long 100 shares of American Thermocrackle Common which showed a paper profit and he decided to sell rather than stay locked in. So he entered a GTC order to sell a round lot at 75.

By pulling definitions out of the Exchange booklet, what happened to Mr. Midland becomes as plain as a dividend check.

Long 100 shares: Mr. Midland owned 100 shares of American Thermocrackle.

Common: This class of stock represents an ownership interest in the corporation—its plants and raw materials, its patents and good will, everything.

Paper profit: Mr. Midland's unrealized profit. It will become actual only when stocks which have increased in value are sold.

Locked in: Despite his paper profit, Mr. Midland has so far refused to sell because his gain would become subject to a high capital gains tax. Since this is an obvious disadvantage in selling, he becomes locked in.

GTC order: An order to buy or sell at a particular specified price which until executed, remains "Good 'Til Cancelled."

Round lot: A unit of trading, or multiple. Generally, 100 shares. An odd lot is, generally, any order from one to 99 shares of a particular stock.

This is the language of Wall Street. But, increasingly in recent years, it is being heard along Main Street too, and for good reason. More than 12.4 million Americans own stock in the nation's businesses, and another 100 million own shares indirectly through their investments in savings accounts, insurance, pension plans and annuities, which in turn invest.

Under the circumstances, it isn't surprising that Americans have become more interested in business as their investments increase.

If financialese still baffles you, now's a good time to brush up. "The Language of Investing" is available without charge from Department LI, New York Stock Exchange, 11 Wall Street, New York 5, New York.

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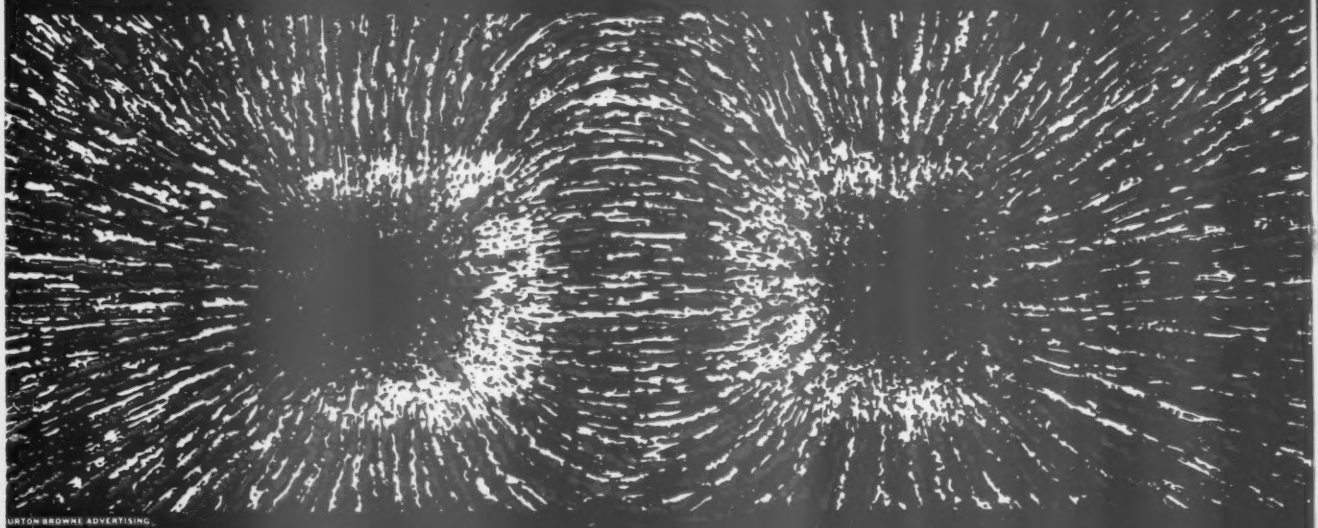

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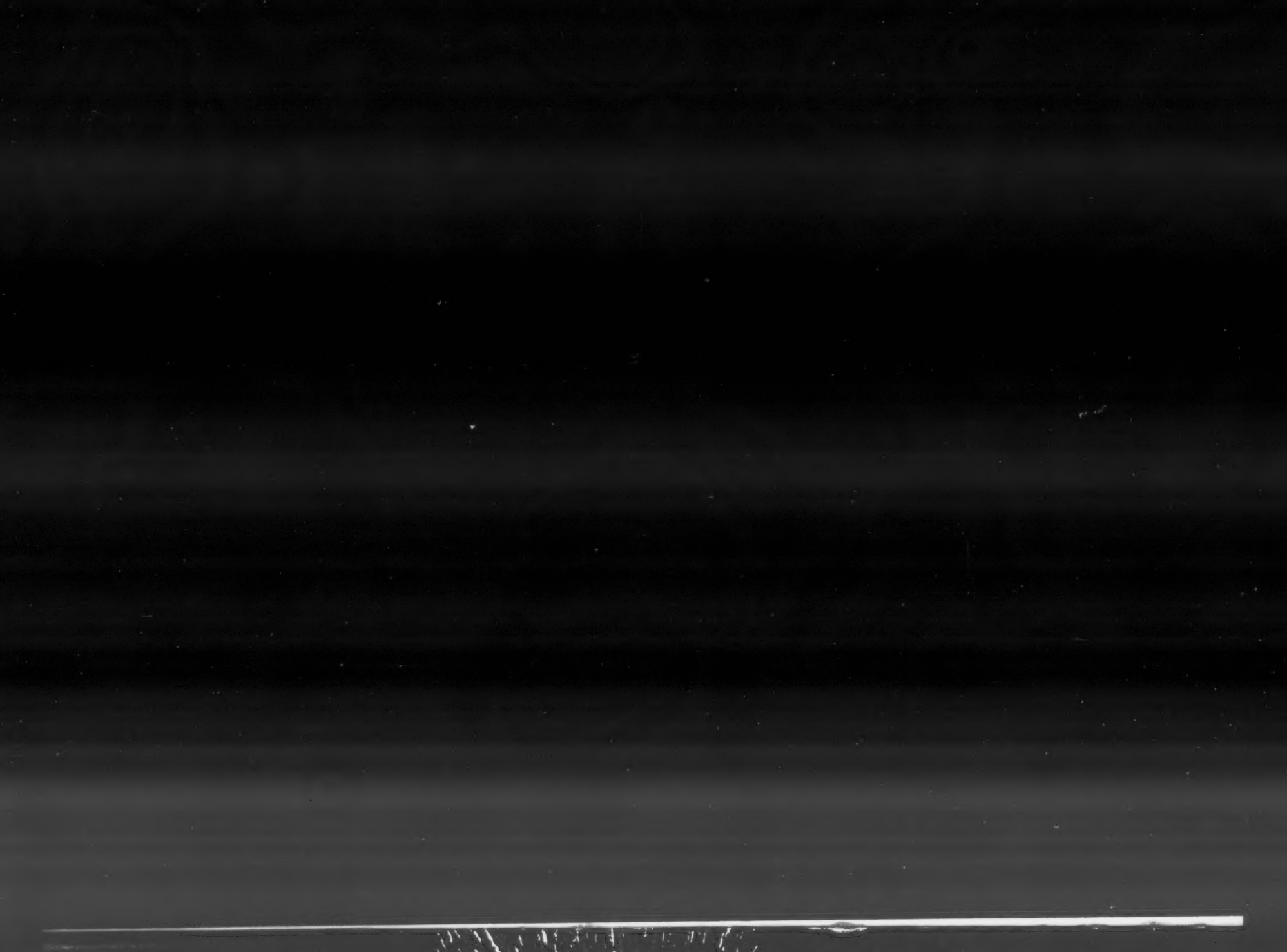
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